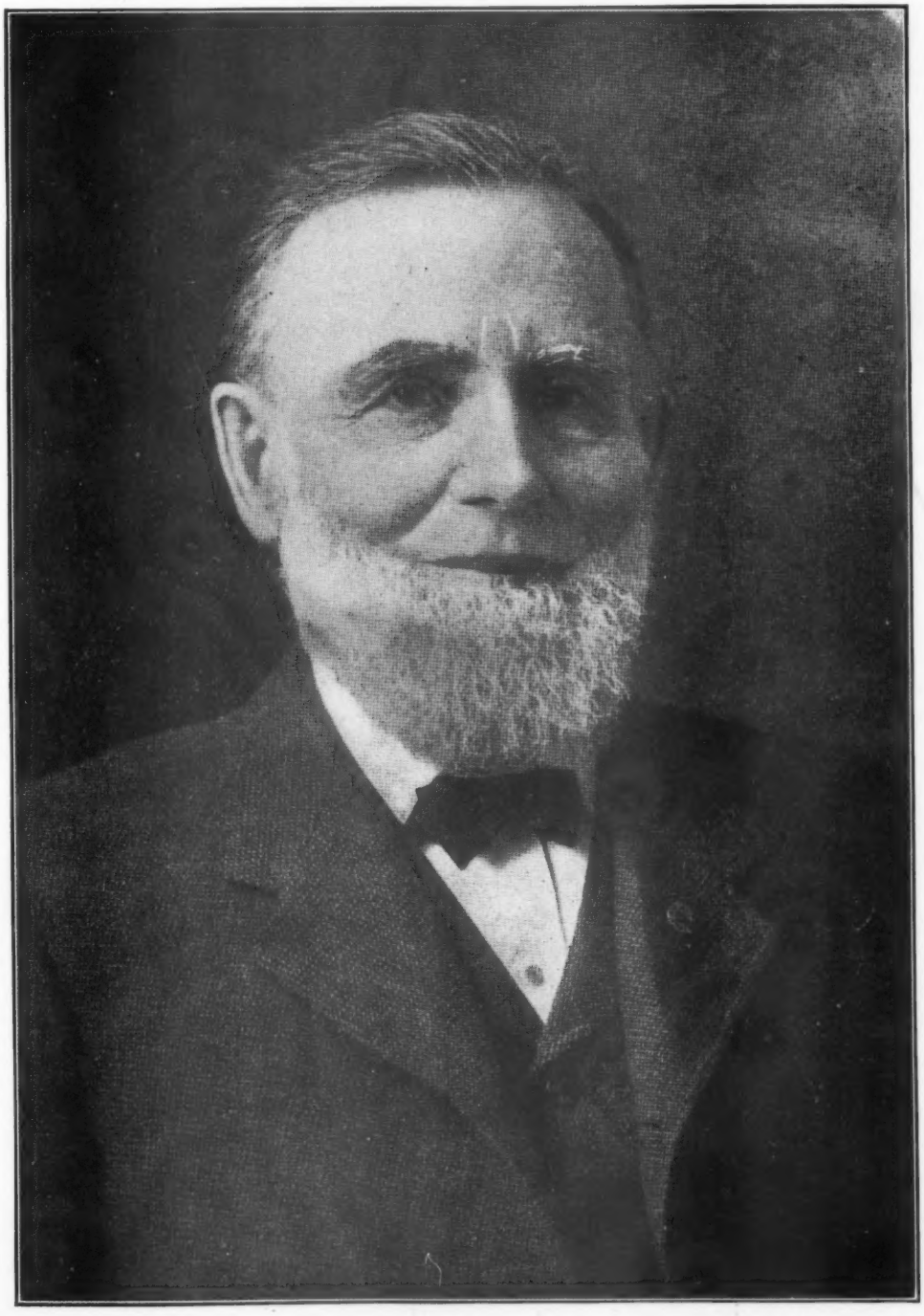
AMERICAN BEE JOURNAL

OCTOBER, 1920



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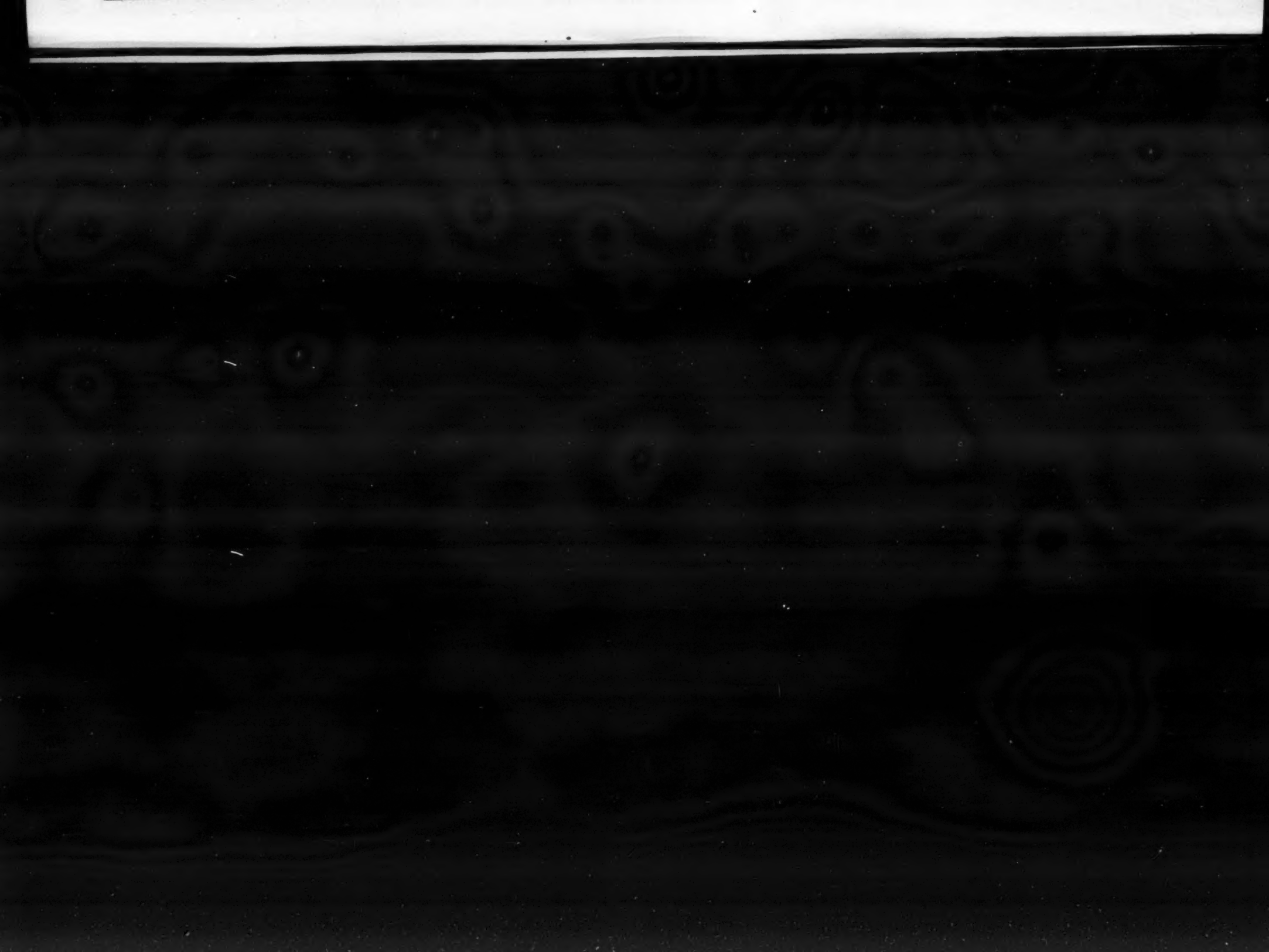

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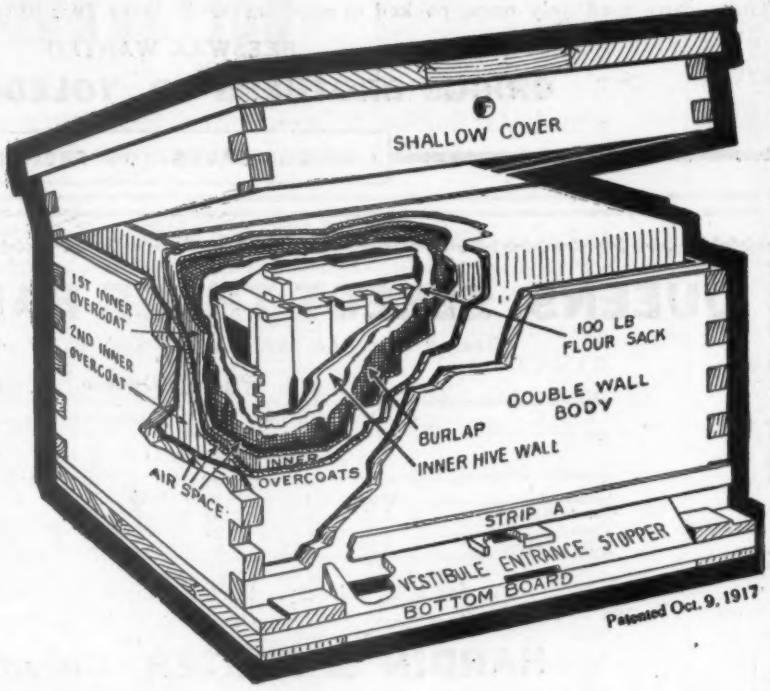

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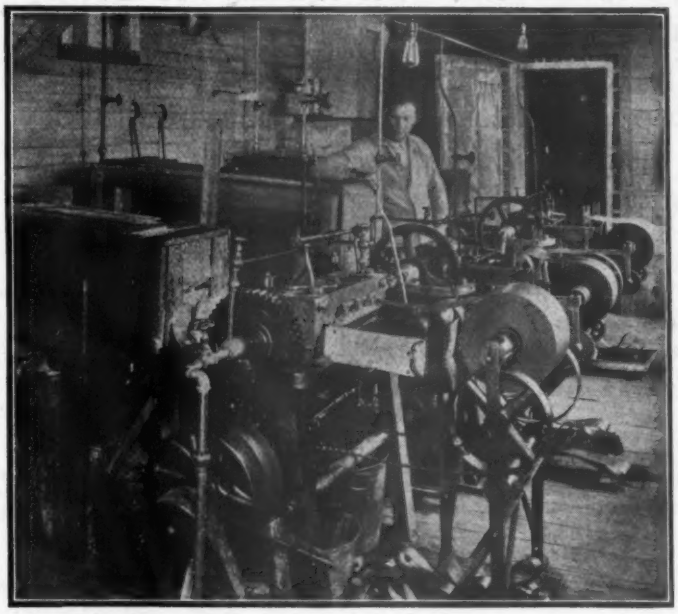

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VOL. LX—NO. 10 HAMILTON, ILL., OCTOBER, 1920 MONTHLY, $1.50 A YEAR

A MILKWEED THAT CLIMBS

BY EDWIN G. BALDWIN, PH. D.

PLANTS are as particular as people in their preferences for certain places. Odd, how "picky and choosey" some people are about where they live. There are many representatives of the vegetable kingdom that will grow in very limited localities only and will thrive in still more circumscribed areas. The predilections of plants and trees for their favorite regions of growth are as pronounced as those of the most fastidious humans. For example, the black mangrove refuses to make its abode save where its roots can get a taste of brackish water, south of the 29th degree of latitude. The fireweed (willow herb) refuses to flourish unless its trail has first been blazed by fire; then it straightway leaps forth, Phoenix-like, from the ashes. In a wider sense the same is true of the Tupelo-gum, the pecan and other trees, plants and shrubs.

Probably no plant is more particular about its habitat than the **Gonolobus,** or vining milkweed. There are several species of the genus, but the one of special interest to beekeepers, for reasons to be stated later, is the **Gonolobus laevis,** the type-species of them all. Very little information about the vine can be obtained from the botanical books in the public libraries, or even from the more specialized volumes of the university departmental collections. The average work in botany is content to state something about as follows:

"The plant occurs rather frequently along river banks from Pennsylvania, west to Kansas and southward."

The single phrase "along river banks" gives the reader only a very general impression of the favorite habitat of **Gonolobus** and a still more limited idea of the exact regions of its growth. It was during two years spent in extension work among the beekeepers of Indiana that the writer first became interested in the vining milkweed and its commercial importance as a honey plant. But the absence of any adequate data on it, and even the lack of knowledge among the beekeepers generally regarding its value as a honey producer, stimulated the writer to begin a systematic study of the vine and its value, habits and habitat; of its vicious qualities as well, for it is not an unmixed blessing. Several articles have appeared regarding the vine as a honey producing plant, and the readers of the various bee magazines have been told that there is such a honey producing plant as the vining milkweed, but the regional differences have not been emphasized nor clearly defined.

NOTICE

Beginning October 15th, the subscription price of the American Bee Journal will be $1.50 per year.

All subscriptions mailed before that date will be entered at the present rate of $1 per year.

The Plant

Many of the members of the milkweed family are valuable to the beekeeping fraternity as nectar secreting plants, but the vining milkweed seems to be the only one to yield surplus honey in any quantity. It is a true vine, and yet a real milkweed. In luxuriant growth it is almost equal to the rank Kudzu recently imported from Japan. The huge seed pod, filled when ripe with fluffy, downy seeds that float on the lightest breeze, would convince anyone that it is a milkweed. The inconspicuous flowers, bluish white in color, are in striking contrast to the broad, dark green leaves, to the giant seed pods and to the coarse, rank vine. The leaves are heart-shaped, not unlike those of the large species of **Convolvulus,** or morning glory.

Its Habitat

On suitable soils it grows wondrously, thriving best in alluvial lands along fresh water courses, especially along bottom lands of river courses, where inundations are frequent. While it is occasionally reported as growing on hillsides and in thickets and fence corners, its real home is the rich, black loam of the overflowed lands.

It has been reported as found growing in West Virginia, notably in Putnam and Mason Counties, and abundantly about Charleston, W. Va., on the banks of the Kanawha River. Ohio reports it through the southern part of the State, it being found most abundantly in those counties bordering the Ohio river, viz.: Washington, Scioto, Brown, Clermont and Hamilton, and also in a few counties farther north, Montgomery, Ross and Warren. In Kentucky it is very common, being most frequently met with in the northern part of the State bordering the Ohio River. It has been reported from Henderson, Louisville, Ludlow and Owensboro, for example, along the river just named; also from Tyrone, on the Kentucky River, from Versailles, Woodford County. It is occasionally found as far east as Natural Bridge (Wolf County), and at Harlan, in Harlan County, both places being in the foothills of the Blue Ridge Mountains. Bowling Green also reports it in Warren County. Tennessee is not favorable, apparently, to the plant; in fact, the heads of the Department of Botany in both Vanderbilt University and Peabody College there report that they have never seen the plant growing in the State; moreover, Gattinger makes no mention of it in his "Flora

of Tennessee." But the curator of the Herbarium at the Missouri Botanical Gardens in St. Louis, Mr. J. M. Greenman, says they have one specimen of **Gonolobus** in their museum, from Knoxville, Tenn. It is probably sporadic in the State; in fact, we should expect that it would not thrive save possibly along the western line, near the Mississippi River lands.

In Indiana it has been found growing as far north as Knox County, along the Wabash and White Rivers, and the tributary streams there. One specimen has been sent in from Jackson County, Indiana, but the plant never spreads there, for the land is hilly and unfavorable to the growth of the vine, in the vicinity of Brownstown, where the one specimen was found. It is in the counties of Gibson, Posey and Vanderburg, in southwestern Indiana, and in the counties of southeastern Illinois and northern Kentucky, across the Ohio and Wabash Rivers, that the overflow lands offer ideal soil condition for rampant growth. The plant has been reported from Wabash County, Illinois, bordering on the Mississippi River, from Pulaski County, from Pope and Pike Counties in the extreme southern part of the State.

West of the Mississippi River it is reported in Missouri at St. Louis, at Columbia on the Missouri River, and at Courtney, Alba and Harlan. It is reported at Webb City and Orange, in the extreme southwestern part of the State. Oklahoma reports it from Kay and Harmon Counties, bordering on the southern line of Kansas. The writer has found it reported only at Hot Springs, Arkansas, but it is probably found elsewhere in the State. In Texas it is found very common in Austin and eastward, generally on low ground, only occasionally on hillsides. Specimens of **Gonolobus laevis** also are found at Granbury, Tex. Other species of the plant are reported in Texas as far west as Limpia Canyon, in the Trans-Pecos region. It has been found in New Orleans, La., along the Mississippi river, and at Alexandria on the Red River. In Georgia it has been seen growing at Saffold, on the Chattahoochee River, and in Florida in the Duval, in the northeastern portion of the State.

* * * *

A glance at the accompanying map may make the extent of the growth of **Gonolobus** more clear to the eye geographically.

It is at once apparent that the vining milkweed is native to the south central portion of the middle west, that it is at home on fresh water lowlands; that it is not coastal, but loves inland rivers and lakes, but not the sea. It is also clear that its appearance in rugged, hilly sections is exceptional, and that on such soil it has no tenacious hold and, finally, that its real habitat is in rich, black loam, especially such as is subject to inundation. One feature is most suggestive, for a careful study of the river courses along which its growth is recorded reveals the fact that the water courses are the Mississippi River and the streams that are tributary or ultimately tributary to the Mississippi. For example, the Kanawha River in West Virginia flows into the Ohio and the Ohio into the Mississippi; the Miami River in Ohio, the Kentucky River in Kentucky, the Wabash between Indiana and Illinois, the Missouri River in Missouri and the Red River in Texas and Louisiana are all tributary to the Mississippi. It looks as if the limits of the native haunts of **G. laevis** were almost identical with the boundaries of the "Father of Waters" and his far-flung tributary streams. A few other specimens of **Gonolobus** so far reported may possibly be taken as occasional or accidental. However, the geography of the region covered by the plant is certainly full of suggestion.

Commercial Importance

The soil of the overflow lands already mentioned in southwestern Indiana is undoubtedly the one place suited above all others to the development of the vining milkweed. The cornfields of that region, thousands of acres, forming an almost unbroken sea of green, are especially favorable to the growth of the vine. It not only needs wet ground for its best growth, but it needs wet weather as well, though it blossoms best in dry weather. In wet seasons, when the corn is difficult to till, the vine grows and thrives, seeming to laugh its defiance in the faces of the baffled planters. So rapid is its growth that even after the corn is laid by, in May or early June, the vine can still attain maturity by the middle of July. So dense is its growth in favorable soil that, to use a phrase often heard in those parts, "If you take hold of one corn stalk, you can shake every stalk in the field." The sprawling vines cover the tops of the cornfield, fairly forming a carpet of dark green leaves above the sagging corn.

Bluevine or climbing milkweed.

The Name

The botanists call it sand vine or Enslen's vine. The local nomenclature is vastly more rich and varied. Some call it dry weather vine, others devil's shoestring, others blue vine. Occasionally, by confusion, it is termed wild cucumber, but the latter is an error. Finally, the name wild sweet potato vine is heard. No guarantee is here given that even this goodly list of vernacular names is complete.

Previous to the spring of 1918 the writer could not learn the correct name of the plant from even those beemen who knew the value of the plant as a honey producer. None seemed able to identify the plant, and few beekeepers outside of its densest growth ever dreamed that it was valuable as a honey plant. Occasionally short notices of it would appear in the Bee Journal. In the Spring of 1918 the Department of Agriculture at Washington identified the vine as the **Gonolobus lævis,** or vining milkweed.

The Yield

Small though the blossoms are, they are extremely rich in nectar under proper weather conditions. Dry weather during blossoming time is absolutely essential to nectar secretion from **Gonolobus.** Then the nectar is secreted so copiously that it seems impossible for any number of colonies to overstock a location. A hard rain after blooming is well started, ends nectar secretion for that season; at least subsequent yields are small in comparison. Hence, the local name "Dry Weather Vine." The name blue vine is undoubtedly suggested by the tiny bluish flowerlets. It is easy to guess who gave the name devil's shoe string. Let the weather hold hot and dry and the bees roam amid the blossoms from early morn until late at night. A daily gain of four pounds has been recorded on a hive scale for a period of 15 consecutive days during the summer of 191[illegible]. One beekeeper secured a yield of 75 pounds per colony from 60 colonies in five weeks time. It is a very sure

yielder if the weather is dry , as it usually is during July and August.

The Honey

What kind of honey is produced from **Gonolobus?**_ In color it is almost clover white, of fairly good body and very aromatic in flavor. It does not granulate readily, even in cold weather, but it has one peculiarity that marks rather than mars the product. When thrown from the extractor, or even while being uncapped in the comb, tiny bubbles appear all through the honey in a way very suggestive of fermentation. In this respect it resembles the honey from the Cabbage palmetto. In neither honey is the characteristic bubbling due to real fermenting. The reason has never been satisfactorily given. This peculiarity is noticeable in the honey from the vining milkweed, even after bottling. At first it takes on a milky or cloudy appearance; a cloudiness that reappears whenever the honey is shaken up, but which disappears when the honey is allowed to stand. Slight heating quickly drives off the bubbles and restores transparency.

The taste would probably rank it with the best of table honey anywhere. Most of those who taste it for the first time are enthusiastic over it, and pronounce it "the finest ever," but, of course, superlatives are easy. In point of time throughout the cornfields mentioned above **Gonolobus** is followed by the one-seeded burr cucumber **(Sicyos Angulatus),** which also yields a white honey and blends easily with that of the earlier vine.

The vine seems to have given commercial importance to beekeeping in the entire area wherein it grows only along the confluence of the Wabash and Ohio Rivers near the point where Indiana, Kentucky and Illinois meet. That region is indeed a land flowing with milk (weed) and honey. In the region last named it offers great possibilities for migratory beekeeping from the higher clover levels to the bottom lands. The moving of the bees there, is not over long distances; it can almost all be done in auto trucks a dozen or twenty miles at most. Good returns await the man who knows how. No other States or sections in other States, so far as known, have given any commercial value to **Gonolobus** as a honey producer.

A Warning

Some beemen are writing to secure the seed of the vining milkweed and some beekeepers have sent it on request. It should be noted that from an agricultural viewpoint the vine is a pest of the worst sort. When once it gets a foothold in the proper soils it seems ineradicable. Good weed laws would put a ban on the distribution of the seed altogether, but, unfortunately, most State weed laws cover only Canada thistles and occasionally wild carrot and white daisy. However, the great fears sometimes expressed regarding the weed as a pest, while no doubt well founded in southwestern Indiana, are no doubt exaggerated in regard to the most of the area from which it has been reported. For in all the area of its distribution it has become a real menace to the farmers in only the one area named, and conditions for its best growth are rarely found.

TWO QUEENS WITH A SWARM

By Rob't A. Greene

A few days ago a good-sized swarm issued from one of my colonies and clustered on a low apple limb. As soon as I discovered them I shook the cluster into a bushel basket and dumped them into my "swarm hive," which I always keep ready. I saw the queen, a three-banded Italian virgin of good shape and color, as she passed in. About half the bees stayed in the hive and half went back to the tree. I repeated the process of shaking into the basket and pouring into or in front of the hive five times at intervals of about an hour before the majority of those bees would remain in the hive and not return to the tree.

I didn't understand it, but the next day, when I cautiously went through the hived colony, I found a solution. The large Italian queen was found on the bottom very much excited over something the bees were balling. A puff of smoke revealed a second queen, somewhat smaller and darker, lying on her back in a dazed condition, but kicking and piping faintly. Her body swelled slightly and she died a few hours later.

I suspect that two queens, hatched at about the same time and having, of course, the same hive odor, took flight with the same swarm. One was hived at the first shaking; the; other eluded me for several shakings, and each time regathered her followers. The next day the queens met, probably for the first time, in the hive which each believed to be her own domain. Had I peeped in half an hour sooner presumably I would have witnessed the royal duel.

It was, to me, a remarkable instance of the automatic working of the natural law of the survival of the fittest.

New York.

(It frequently happens that two or more queens will be found with a swarm, although it is more likely to occur with afterswarms than virgins emerging about the time the swarm is leaving the hive to fly out with the bees.—Ed.)

ANOTHER KINK

In a recent article in one of the bee magazines I saw an account of how one beekeeper protected the wood of his frames from the cutting of the wire which tended to make the wire sag, using shoe eyelets.

This was efficacious, but having no eyelets, and not being able to get them immediately, I cast about for a substitute, and found one, as follows:

Drive slender brads into the sides of the end pieces, letting them go through the holes. If, now, the wire is passed through the holes so that the pressure will come on the brads the wood is protected, and there will be no sagging of the wire.

A. F. BONNEY.

REMEDY FOR STINGS

I have read of using hot water for bee stings, as well as some other remedies. I tried a number of remedies and finally decided that the only cure was in prevention, until I tried blowing hot smoke directly on the point where the sting entered the flesh. Hot smoke relieves the pain, and for many years I have not tried any other means of relief. The hotter the smoke the better.

O. K. Rice,

Gray's River, Wash.

(The associate editor has used the same means with good results for several years.)

SUMMER MEETING

The annual meeting of the Northern Illinois and Southern Wisconsin Beekeepers' Association will be held in the court house in Freeport, Ill., on Tuesday, October 19, 1920. All interested in bees are invited to attend.

B. KENNEDY, Sec.

Map showing regional limits of bluevine or climbing milkweed.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

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C. P. DADANT .....Editor

FRANK C. PELLETT .....Associate Editor

MAURICE G. DADANT .....Business Manager

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THE EDITOR'S VIEWPOINT

The Nestor of American Beekeeping

It is with both **sorrow** and **pride** that we record the demise of the venerable man whose features adorn our front cover page this month, Dr. C. C. Miller, who was probably the most prominent figure in the apiarian world. Sorrow, because we lose the advice and help of a man of great capacity and good judgment and a good friend. Pride, because he left behind him, with us, a reputation untarnished by any blur.

Dr. Miller had an international fame, being known almost as well in Canada, in Europe, in Australia, in New Zealand, in **any** foreign country,

Doctor Miller as a young man.

as in the United States. His teachings have been quoted in every country where progressive beekeeping has made its way. He was the author of four books: "A Year Among the Bees," published in 1885; "Forty Years Among the Bees," published in 1902; "Fifty Years Among the Bees," published in 1911, and "A Thousand Answers to Beekeeping Questions," compiled and published, in 1917, by M. G. Dadant, from his answers to questions in over 20 years of the American Bee Journal. The first article from his pen, on beekeeping, published in this magazine, in October, 1870, written on "Introduction of Queens," shows that he had already, 50 years ago, some experience with bees, and indicates the careful methods in which he persevered for more than 50 years.

The great strength and influence of Dr. Miller over the reading public were due to his being always ready to say: "I don't know," rather than give a doubtful statement. He had a witty manner in replying to absurd questions that made his answers entertaining, without in the least angering the enquirer. Very few men have such winning ways. His private correspondence showed even more wit and greater consideration than his published statements and made delightful reading.

During the months of January to March 1916, the American Bee Journal published Dr. Miller's personal recollections, an autobiography. From this contribution, we glean the following facts concerning his life:

He was born July 10, 1831, at Ligonier, Pennsylvania. His education was acquired first in the public schools, then successively at Jefferson College, Cannonsburg, Pennsylvania, and at Union College, Schenectady, New York, where he paid his way, boarding himself, so that at times his board expense "did not exceed 35 cents per week." Those were not profiteering times, it seems.

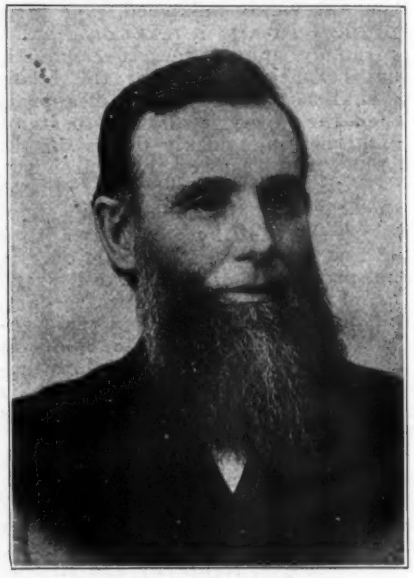
He finally became a teacher and afterwards studied medicine with a Dr. Sheridan, at Johnstown. He went west, was graduated an M. D. at Ann Arbor, Michigan. Later he went to Earlville, Illinois, then to Marengo, where he began beekeeping and remained the rest of his life. He was married twice, his second wife, Sidney Jane Wilson, survives him. He leaves one son, who, however, takes no interest in bees.

Dr. Miller was a great musician, a composer of both church and lay tunes. We have from him several beekeepers' songs, the stanzas of which were written by the late poet-beekeeper, Eugene Secor, of Iowa: "Songs of Beedom," "The Beekeeper's Lullaby," "The Hum of the Bees in the Apple-tree Bloom," 'Buckwheat Cakes and Honey."

Dr. Miller also wrote numerous articles for other magazines, such as Gleanings in Bee Culture, and for many years editorials for the American Bee Journal, when it was published by Geo. W. York, in Chicago. Mr. York was the man who first called him "The Nestor of American Beekeeping"; but he also was known as "The Sage of Marengo," during the later years of his life.

Sick only a short time, our friend retained his self-possession until the last two days, when he became delirious and his face was much drawn with pain. But just as he drew his last breath, a change passed over his face, a beautiful smile came to his lips and his whole countenance was changed.

It is human to regret what we lose. But in this case why should we



Dr. Miller at 54.

mourn? He was over 89 years at his death and had had a span of life given to very few men. He was useful to the last, since some answers to questions were found in his typewriter after his death. He did his duty to all, and after a short illness left a beautiful memory. The good wishes of the entire bee family, in both hemispheres, will go to his wife, his relatives and friends.

Duration of Development of Insects

The "Bulletin de la Societe Ro-Romande," of Switzerland, in its August number, reports that Dr. Arnold Pictet, of the University of Geneva, made some 1,500 experiments and observations, upon the influence of atmospheric pressure upon the length of development of insects, during their metamorphoses, and especially during their nymphal life. According to these, the greater atmospheric pressure increases the duration of development, while a lesser pressure hastens it. These experiments are described in the Bulletin de l'Institut Genevois of 1919. The influence of atmospheric pressure upon bees might be ascertained in similar studies.

Troubles of the Queen Breeder

The associate editor has recently visited a number of queen breeders in Tennessee and Mississippi and found that they have been working under difficulties the past season. The honey-flow has been very poor, making it necessary to feed sugar almost constantly, in many cases. There has been so much rain, also, that they have often found it impossible to work with the bees for days at a time. Under such conditions the number of good queen cells built would be greatly reduced, from what could be secured under favorable weather conditions. Even at best the queen breeder can never tell in advance how many queens he can furnish at a given date. Orders were accepted with the best of intentions and with the full expectation of being able to send the queens forward promptly. With bad weather the orders were of necessity delayed or money returned to the great disappointment of the customer, and yet through no fault of the breeder. Until one has had actual experience in rearing queens he can never fully realize the problems which the breeder has to face.

While it is very trying to be unable to secure bees or queens bought and paid for months in advance of the time when needed, we hope our readers will bear in mind the difficulties of filling such orders at a particular time and give the queen breeder a fair chance to make good any complaint before taking it up with us. We use every precaution to make sure that every advertiser is reliable, and want to know in case any fail to live up their agreements, but give them a fair chance to make good before complaining.

A Letter From the Caucasus

It is with great pleasure that we give herewith the translation of a letter received from Professor Gorbatcheff, which will show better than newspaper articles what the conditions are and have been in those countries. It appears that the countries of the Transcaucasus have formed into republics, and so this letter was stamped with the postage of a new government, the "Republique Georgienne." The letter follows:

Tiflis, July 15, 1920.

Mr. C. P. Dadant.

Honored Sir: It was a matter of great pleasure to me, the other day, to receive the April number of the American Bee Journal, two letters from your office and three letters from American beekeepers enquiring into the possibility of importing Caucasian queens into America. It is almost five years since I have been able to correspond with Europe and America. Even today we have no postal service with central Russia.

You may imagine my joy before those first swallows coming from a civilized country. Being in the habit of perusing each month some 20 Russian bee magazines and a dozen foreign ones, I am truly starving for the intellectual food which I secured from this special literature.

Your green-covered American Bee Journal for April, bearing a portrait of Moses Quinby, has given me as much pleasure as must have given the dove with its olive twig plucked off, to Noah in his ark. I believe that you, as well as those of our American colleagues who take interest in bees, will be glad to get some information concerning us.

None of the branches of farming industry was as much injured, during that period of war and revolution as was beekeeping. The best modern apiaries were destroyed and in some regions beekeeping is no longer extant.

From the information that I can secure irregularly, it appears that the apiaries of the north of Caucasus, down to the countries of Kouban and Tersk—those Californian bee counties, are also devastated.

But beekeeping is a phœnix, and it comes to life from its ashes in the midst of revolution fires. In the Transcaucasus, that is to say in the newly organized republics of Georgia, Armenia and Azerbijan, we recognize at present a growing interest for beekeeping. The requests for bees and bee appliances come in large numbers. Thanks to the intensification of rural industry in the Transcaucasus, beekeeping is likely to secure there an honorable position. During the past two years the crops were excellent and the apiaries which were miraculously spared yielded an extraordinary crop, several apiaries yielding 4, 5, and even 8 pouds (The poud is equivalent to about 36 pounds.—Editor) while usually one poud, taken from each colony, is considered a good crop.

In closing, I will quote to you the prices now current in Tiflis:

A poud of honey (36 pounds), 4,000 t 5,000 rubles; former price, 8 to 12 rubles.

A poud of beeswax, 6,000 to 8,000 rubles; former price 18 to 24 rubles.

Comb foundation, English pound, 300 rubles; former price 32 to 40 rubles.

Dadant hives, 1,000 to 1,200 rubles; former price, 8 to 12 rubles.

Honey extractor, 10,000 to 12,000 rubles; former price, 24 to 30 rubles.

(The ruble, normally worth 51½ cents, is very much depreciated at present. It is not now quoted on the financial markets.—Editor.)

Just now, central Russia cannot be reached by way of the Caucasus. But commercial transactions are getting arranged with France. Transcaucasus has great need of commercial exchanges with America, and those would be more easily organized than with Europe.

Accept my best wishes,
C. A. GORBATCHEFF.

Loss of Bees in Shipping

In buying bees in packages shipped by express, the customer should always make sure that in case any considerable part of the bees are dead on arrival, that the agent makes note of the fact on the express receipt before paying. Too often beekeepers make claims against the breeders for loss in shipment, yet because of their failure to have the agent note condition of bees on arrival, the breeder is unable to secure settlement from the express company.

We believe that all our advertisers are reliable and will make good any losses for which they are responsible. The express company is responsible for losses in transit, and unless the facts are noted on express receipt the shipper has no recourse.

Parcel Post Extracted Honey

We are in receipt of a 5-pound can of extracted honey of excellent quality from R. A. Bray, of Big Timber, Montana. The honey came all the way without any wrapper. The top was fastened on in what is, to us, a novel way. The friction top was simply fastened down with 3 small nails, driven through the can at the top and bent down on the depressed surface of the lid. Honey, put up in this way and carefully wrapped in corrugated pasteboard, can probably travel safely from one end to the other of the United States.

Extracts

J. E. Crane, in July Gleanings, says: "I do not know at present of an apiary or a colony in our State (Vermont) where American foulbrood exists." As they have had considerable foulbrood in Vermont, that is an evidence of what may be achieved with methodical action and perseverance.

"A colony which has built cells appears more unwilling to accept a new queen than one requeened as soon as dequeened.—Elmer G. Carr, of New Jersey, in Gleanings for August). Same here, Mr. Carr. For safe introduction we do not want the colony queenless a single minute.

Fifty Years Ago

Fifty years ago the beekeepers were using large space in the discussion of the best kind of hive. Many hives of many kinds which attracted much attention then have long been forgotten. The Thomas hive, the Economic hive, Gallup's hive, the Excelsior hive, the Diamond Frame hive and dozens more have long passed from public notice. Fifty years ago the extractor was just coming into use and frequent articles about "The Honey Slinger" appeared in the magazines of that date. The control of queen mating was a live subject then, and now and again some one appeared with a sure method.

Some subjects which have been discussed for fifty years are still unsettled. Size of hives and deep vs. shallow frames were the cause of much argument then as now.

Fifty years ago Langstroth, Quinby, Charles Dadant and Henry Alley were frequent contributors to the American Bee Journal. Dr. C. C. Miller is about the only man who was writing for this Journal at that time who continue to do so until the present. In the is ue for October, 1870, there are two articles from his pen.

OBSERVATIONS ON AMERICAN FOULBROOD

By G. F. White, B. S., Ph. D., M. D., Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C.

Many beekeepers are driven from the profession and many prospective ones are deterred from entering it on account of the losses that result from the bee diseases. As a remedy for this condition it is proposed that the beekeepers, both active and prospective, become as familiar as possible with the facts which are known about these disorders.

American foulbrood is responsible for greater losses than any of the other diseases. It has been studied for a considerable number of years and in the present article* are given some of the observations noted, which, it would seem, might be of interest to all beekeepers.

Name of the Disease

The history of the period before Christ shows that bees at that time died from virulent diseases. It is not possible now to determine definitely the number and nature of the bee disorders that existed then, but it is quite probable that all of the infectious ones of today occurred. By what names they were then known is not clearly recorded. Earlier than three and a half centuries ago a destructive, foul-smelling brood disease of bees was being referred to as "foulbrood."†

The name "foulbrood" has been applied probably almost from the beginning of its use to more than one disease. Numerous descriptions under this name occur in the beekeeping literature, which emphasize the ropy and foul-smelling symptoms of the disease. American foulbrood, therefore, is one of the diseases which have been described as "foulbrood" and it still is usually meant and interpreted when the term "foulbrood" is used alone. Since there are two especially important and very different "foulbrood," two names were needed to designate them. In the different countries different names have been chosen and are being used. Probably all of those selected are more or less open to criticism. The name American foulbrood is being used in this country at the present time for the disease which is characterized by the death of brood in capped cells, ropiness and foul odor, and the name European foulbrood for the one which is not so characterized.*

Fig. 2.—*Bacillus larvae*, growing form.

Cause of American Foulbrood

American foulbrood occurs at least in Belgium, Denmark, England, France, Germany, Switzerland, Austria, New Zealand, Canada, Cuba and in many parts of the United States. From this distribution of the disease it follows naturally that its presence in any locality connot be attributed entirely to food or climatic conditions.

No race of honeybees, as far as is known, is entirely immune to the disease. Worker, drone and queen larvæ are susceptible to infection; the adult bees are not.

The inciting cause of the disease is a germ which is called **Bacillus larvæ.** When this parasite is added to honey or syrup and fed to a healthy colony the disease is produced (Fig. 1). It is a small rod-shaped plant (Fig. 2) that can be seen only by the use of a microscope, and then only when it is magnified 600 diameters or more. It produces spores, which are somewhat like seed (Fig. 3). These spores (Fig. 4) are so small that if 20,000 of them were placed end to end, they would measure only about one inch. They live over long periods and are very difficult to destroy, either by heat or chemical disinfectants.

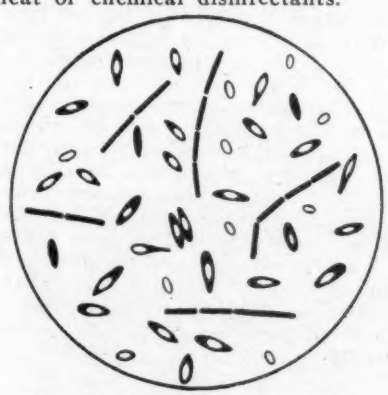


Fig. 3.—*Bacillus larvae, spore formation.*

The spores are taken into the stomach of the larva with the food. They then germinate, and the growing form of the parasite reaches the blood and other parts of the body. This causes the larva to become sick, and in about one week to die. Sometimes the pupal stage is reached before death takes place. The body of each dead larva and pupa (Fig. 5) contains millions of spores. These are capable of producing the disease should any of them reach healthy larvæ and be eaten by them.

Symptoms of American Foulbrood

Inasmuch as the practical apiarist is interested in the colony rather than the individual bee, it is well in discussing the symptoms of any bee disease to consider the colony as the unit. Any evidence of disease that is obtained from a larva, pupa or adult bee is, in fact, a colony symptom. The death of brood or adult bees is frequently the first symptom that is noted. In the brood diseases it is only the brood that dies; the adult bees do not even become infected.

In American foulbrood the brood is almost always capped before it dies. This is due to the fact that the germ does not cause death until one week or more after the feeding larvæ con-

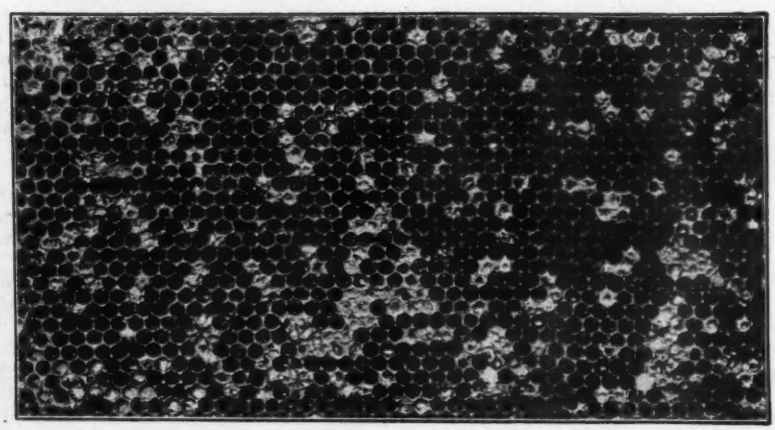


Fig. .1—American foulbrood produced experimentally.

* Bulletin 809, American foulbrood, U. S. Dept. Agr., March 10, 1920, may be referred to by those who desire a fuller discussion of the work done than is given in this article. The technical parts of the bulletin may easily be omitted by the reader who is interested primarily in the more practical portions of it.

† Colonel H. J. O. Walker, of Lee Ford, England, informs the writer that a German beekeeper, Nicholas Jacob, wrote of foulbrood in a book on beekeeping published in 1568.

* By employing the names which are being used in this country for these two diseases, the writer is expressing no opinion as to the best ones which have been suggested and used. A previous discussion of names for the foulbroods occurs in an earlier article in the American Bee Journal, July and August, 1920.

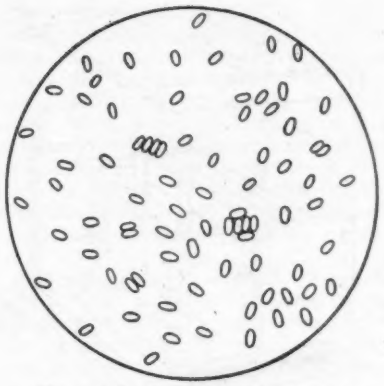


Fig. 4.—Spores of *Bacillus larvae.*

sume food containing it. Since such food is not fed to the larvæ until they are two days or more old, the larvæ almost always reach the two-day quiescent period preceding pupation, or have become young pupæ, before death takes place (Fig. 5). The dead brood in this disease, therefore, almost always occupies the endwise position in the cell.

In American foulbrood there is no sign or symptom known by which one can determine definitely that a larva or pupa is sick until death is very near or has actually taken place. The first symptom to be noticed is that the diseased larvæ or pupæ are slightly more opaque than the healthy ones. At this time they are probably dead. During the decay of the dead brood (Fig. 5) the outward appearance of the larvæ and pupæ changes from that of healthy brood to that of the dry scale. This change is gradual and covers a period of a few weeks, varying somewhat with the climatic conditions present.

The bodies of the larvæ and pupæ, after death, soon soften and the body wall is then easily torn. As the decay continues, the mass becomes viscid, and later so ropy that it can be drawn out into fine threads 2 or 3 inches or even more.

Within a short time after the brood dies it becomes slightly brownish and this color deepens to chocolate, mahogany, and coffee shades as the decay advances.

At some time during the course of the disease the characteristic foulbrood odor* occurs in the colony. It is not noticeable early in the disease and is usually not detectable when only a slight amount of disease is present. It tends to disappear from the brood combs when they are removed from the bees and, after being cut out of the hive for a considerable period, it ceases to be marked and is often scarcely observable. This fact has contributed somewhat to the misunderstanding that has prevailed in many quarters regarding the odors accompanying the two foulbroods.

The adult bees remove the caps from many of the cells containing dead brood (Fig. 5, L, M, Q, R, T). This results in the irregularity in the distribution of the capped and uncapped cells (Fig. 1) so commonly seen in the brood nest. Many of the caps are only punctured (Fig. 5, K) by the bees, while many more remain unaltered (Fig. 5, F).

The decaying brood masses frequently come in contact with the caps and adhere to them if the combs are roughly handled. When the combs are placed in certain positions the viscid masses may pull the caps into the cells, resulting in what is spoken of as sunken caps.

During the early stage of decay, bees remove in a piecemeal fashion portions of the dead brood, leaving remnants (Fig. 5, L) about the brood nest. This symptom is sometimes useful in making an early diagnosis of the disease. Sometimes the bees gnaw slightly the viscid remains and scales. A comparatively small amount of the brood dead of this disease, however, is removed by the bees.

Length of Time the Germ Lives

Since **Bacillus larvæ** is the inciting

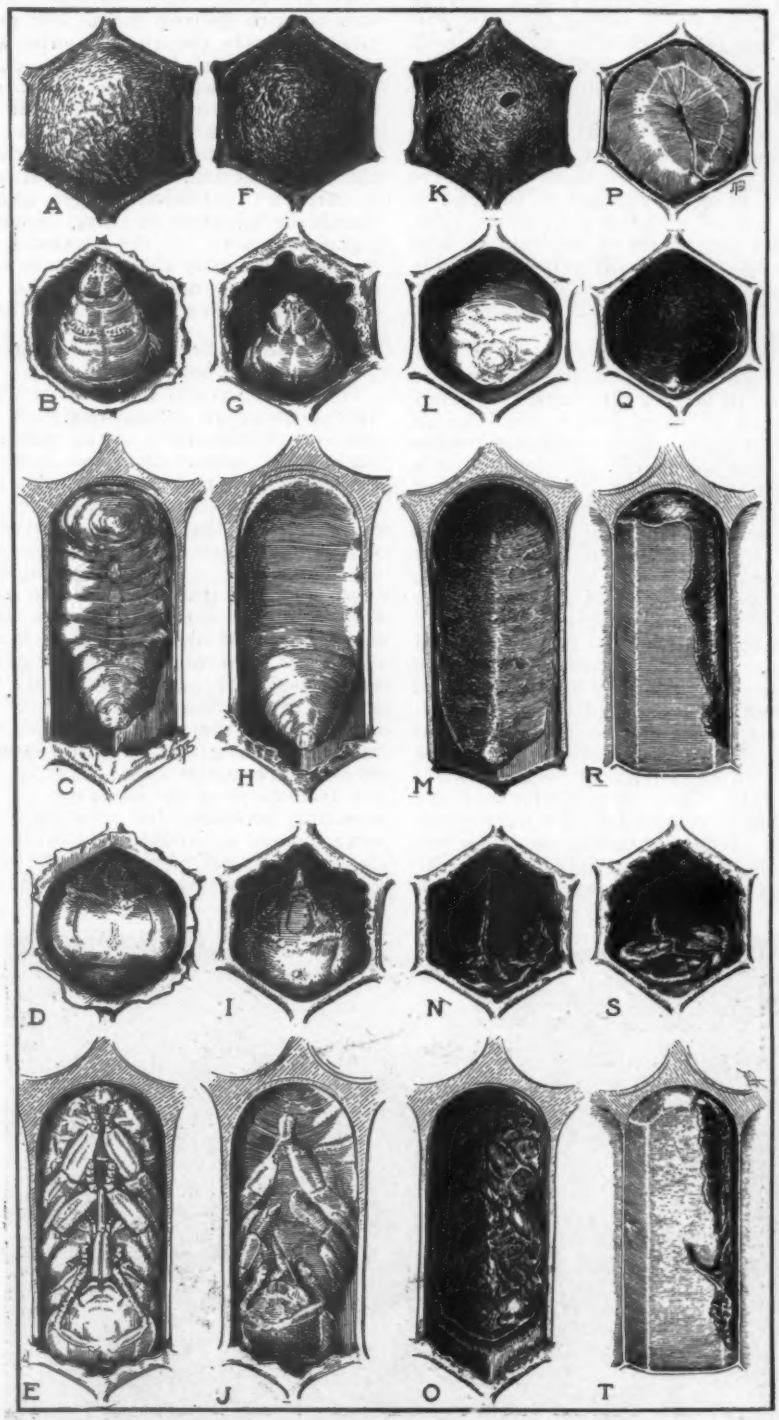


Fig. 5.—American foulbrood. A to E healthy and F to T diseased brood; A, cap over healthy, and F K over diseased brood; G H larvæ and I J pupæ dead of the disease; Q M R, scales of larvæ, R being cut lengthwise and N O S T pupæ dead of the disease, T being cut lengthwise; K, a punctured cap; L, a partially removed larva which died of American foulbrood before reaching the age at which brood is capped. This occurs only occasionally.

* The odor so frequently mentioned in connection with foulbrood has been variously described, being often compared with that of a glue pot. When once learned it can scarcely be mistaken. It is very distinctive, being unlike any other. The writer, therefore, prefers not to attempt to describe it by comparing it with other odors, but to call it simply the foulbrood odor.

cause of American foulbrood, naturally this disease can occur only when the germ is present and alive. The task of preventing the disease by keeping the living germ away from the apiary is not an easy one, although much can be done in this direction. The length of time the germ will live under various environments is, therefore, of first importance.

Some idea relative to this point may be gained from experimental observations which have been made. Scales containing the spores of American foulbrood were collected in 1907 and kept in the laboratory until September, 1916. Each succeeding year, during this period of more than 9 years, tests were made, using some of this scale material, and in every instance the spores were found to be alive. It was found, also, that they were as resistant to heat, and, by the inoculation of the colonies, they were found to be as virulent at the end of this period as at any previous time. It has not yet been determined how long the spores will remain alive in the dry scales, but it is quite probable that they will live much longer than 9 years.

When the spores from the scale material were suspended in water and heated to boiling (212 degrees F) they were all killed in 11 minutes. A half hour or more may be necessary when they are in honey. By employing a higher temperature the period of heating may be diminished.

A water suspension of the scales was poured in a thin layer on glass plates and allowed to dry. These films were exposed to the direct rays of the sun. The spores were found to remain alive for from 28 to 41 hours. They remained alive from 4 to 6 weeks when they were suspended in honey and exposed to the sun.

The spores added to honey and kept away from the direct sunlight were found to be alive and virulent after one year. It is very likely they are capable of remaining so, a very much longer period, in such an environment.

In the presence of fermentation the spores were found to be alive and virulent at the end of 7 weeks, and it is quite likely they would have remained so a very much longer period.

In a 5 per cent carbolic acid solution the spores of American foulbrood remained alive for months; in a 1: 1000 mercuric chloride solution, for days; and in a 10 per cent formalin solution for hours.

From these facts it will be observed that the spores of American foulbrood are able to live over long periods in nature and that the beekeeper cannot wait until they die a natural death, if he wishes to make sure that they are dead, but must take active measures to destroy them. For practical purposes chemical disinfectants are not suitable. Heat would seem to be the most practical agent. Burning or scorching, of course, will kill the spores and the boiling of water or honey containing them will cause their destruction. In practical apiculture a somewhat longer period should be adopted, in using chemical disinfectants to kill the spores, or in boiling to destroy them, than is indicated as being necessary in the experiments which have been cited here.

Experimental Studies on American Foulbrood

It is quite natural that a large number of questions concerning the bee diseases should arrive in the minds of beekeepers whose apiaries are infected or threatened with infection. Many of these questions can be answered by the results of studies which have been made on these diseases in the experimental apiary. During these studies not only have the causes of the bee diseases been discovered, but observations of interest have been noted, regarding the symptoms, the diagnosis and the spread of the diseases, and the effect of them on the colony and on the apiary. During the work no experiments were undertaken directly on the treatment of the diseases, but in selecting problems for solution such were chosen as would yield information which could be used by the beekeeper in devising new methods of treatment or in improving those now in use.

Fig. 6.—Experimental apiary in which American foulbrood was studied.

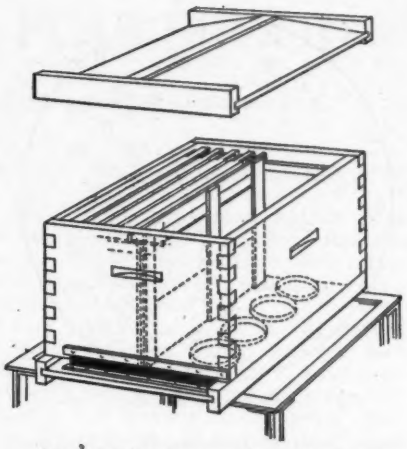


Fig. 7.—Hive for experimental colony.

A knowledge of the methods which were devised and used, in carrying on the bee disease study, is valuable not only to the investigator who wishes to pursue such studies, but also to the practical beekeeper who, by becoming familiar with the experimental procedure and the observations noted, will be able to draw conclusions for himself and to verify or disprove those drawn by others.

The American foulbrood studies were conducted in the same apiary (Fig. 6) as were those on the other diseases, and the methods used are quite similar to those briefly discussed for Nosema-disease and European foulbrood† in earlier articles. From 3 to 5 scales were used, as a rule, in making inoculations. A suspension is made of these by grinding them in a spoonful of water and then adding this aqueous suspension to syrup. The syrup suspension, which now contains millions of American foulbrood spores, is then fed to a colony free from disease. The same kind of experimental hive (Fig. 7) is used as was employed in the studies of the other diseases. The method of inoculation, by which some of the contaminated food is placed directly in the cell with the larvæ, is less satisfactory in studies on American foulbrood than on the other brood diseases.

The first symptom of American foulbrood to be observed, after feeding a colony the germs, occurs during the seventh day following the hour in which the feeding is done. Since the larvæ and pupæ dead of American foulbrood contain millions of spores, any fragment of the dead brood is capable of producing the disease if it reaches feeding larvæ and is eaten by them. The piecemeal removal of the brood (Fig. 5, L) and the slight gnawing of it by the bees tend, therefore, to spread the disease within the colony.

In a few instances only, during the experimental studies, did the disease seem to spread from the inoculated to the healthy colonies of the apiary.

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* American Bee Journal, July, August and September, 1919.

† American Bee Journal, July and August, 1920.

The few colonies which probably became infected in this way stood next to heavily diseased ones. The infection possibly, in these few cases, resulted from a heavy drifting of bees or slow robbing. So far, however, experimental evidence is insufficient to demonstrate to what extent the disease is spread by drifting bees or as a result of different degrees of robbing.

Excepting the few cases just mentioned, the healthy colonies of the experimental apiary suffered no infection, apparently, from the diseased ones present. From this fact, it may be concluded that the disease is not likely to be spread from flowers which have been visited by bees from diseased colonies and afterwards by others from healthy ones. The same fact leads to the conclusion that the water supply of the bees of the experimental apiary was not a fruitful source of infection. It should be mentioned, however, that no stagnant or slow moving body of water was near by. A definite statement regarding the extent, if any, to which the water supply of an infected apiary helps to spread the disease, is not justified from the experimental evidence thus far obtained.

Since American foulbrood can be readily produced experimentally, in a colony, by feeding it syrup or honey to which the spores of the germ have been added, naturally the robbing by bees of honey which contains such spores would likely cause disease in the colonies to which such bees belong.

When brood frames from American foulbrood colonies are placed in healthy colonies they serve to transmit the disease. Should this be done by the practical apiarist during the manipulations in the apiary, naturally a spread of the disease in this way would likely occur.

The fact that there was practically no spread of the disease, from colony to colony, in the experimental apiary, shows that the hands, the hive tool, the smoker and the clothing are not likely means for spreading the disease.*

In these studies the hives in which the disease had been produced by inoculation were flamed inside before being used again. One reason especially for doing this, in case of American foulbrood, is that the bottom board becomes contaminated with the spores of the disease at the time of the inoculation. In no case was the disease transmitted by the flamed hives.

It is not unlikely that the beekeeper will find it to be a safe procedure to omit in well selected cases the flaming or disinfection by other means. Such cases would be those especially in which only a small amount of the disease was present in the colony housed by the hive.

In a considerable number of instances queens from diseased colonies were introduced into healthy ones. No disease resulted in any of these cases. The observations in this connection were not continued, however, over a sufficiently long period to determine to what extent the disease is likely to be transmitted by queens. The danger in this respect is probably less than many at times have supposed.

Frequently the American foulbrood colonies were used for experiments on other diseases. If they were heavily diseased, but sufficiently strong, the combs were removed and burned and the colony was given either combs from healthy colonies or frames with strips or full sheets of foundation. Usually within 2 or 3 weeks the colonies were again in suitable condition for experimental purposes. If the colonies were heavily diseased and weak, the bees were confined, chloroformed and burned, together with the brood combs* and frames.

When a colony becomes diseased as a result of inoculation it never dies immediately. The length of time it lives depends upon a number of factors—the amount of disease present, the time of year and the strength of the colony being among the important ones. It was found that if a colony becomes diseased at any time of the year it invariably dies sooner or later. If strong and heavily infected early in the season it will die before or during winter, but if infected later it will probably winter, but will die the following bee season. If only a cell here and there, in the brood nest, contains diseased brood, death of the colony may be very much delayed, and in a small percentage of such cases recovery possibly takes place. For practical purposes, therefore, American foulbrood colonies should be considered as colonies which, if they are untreated, will die sooner or later of the disease, the exceptions to this rule being few if, indeed, they occur at all.

* While conducting the experiments no disinfectants were used on the hands, hive, tool, or smoker, and the clothing was not changed in going from diseased to healthy colonies. Reasonable care, of course, should always be taken while working with diseased colonies. It would not be well, for example, to test the ropiness of the dead brood with the hive tool and then the brood of a healthy colony without first removing the disease material from the tool. The cleaning of it can be easily and probably safely accomplished by thrusting it a time or two into the soil—a method which beekeepers sometimes employ.

* The wax was not saved during these experimental studies, as it was not economical to do so. No experiments were conducted directly on the question of the transmission of the disease by way of wax from diseased colonies used as foundation. The facts at hand tend to indicate that the disease is probably not spread in this way.

SOLDERING HONEY PAILS FOR PARCELS POST OR EXPRESS

By Ivan Whiting

During the last few months there has been some discussion about soldering honey pails and the spread of foulbrood because of unwashed containers. It seems very reasonable to believe that few containers would be discarded if they were useful after the honey was removed. A honey pail soldered between the pail and cover becomes a useless container. As advocated, a label requesting that the container be washed before being thrown away would be helpful and should be required on all honey from foulbrood yards.

In disposing of my 1918 honey crop I sent a few 10-pound pails by parcels post about 150 miles. Some pails had no protection, some were covered top and bottom with lath strips between, and some were boxed, but none were soldered. Over half the honey was lost. Some disappeared "without a trace," some spilled in the mail sacks, same on depot platforms, etc. In 1919 I sent about 30 pails the same distance, except one pail sent to Kennewick, Wash, by express, all soldered by my method, and no honey was lost. I discovered it was absolutely necessary to solder the covers on.

The accompanying photograph shows how my pails are fixed. Three straps of light (IC) tin ¼x1½ in. are soldered on the pail, as shown at the left. Then the pail is filled, the straps bent over the edge tight, fitted into the cover, and soldered to the cover. To remove the strap, cut it in two with can opener or pointed tool, grab each piece with a pair of pliers and pull it off. Nothing is left on the pail except a little solder, which will not interfere with the future usefulness of the pail. It certainly takes

Whiting's method of sealing honey pails for shipment by parcels post.

much longer to solder straps on pails than it does to solder the cover 3 or 4 places in the rim, but I believe it is worth while. The average beekeeper who ships his honey in pails could solder all his pails for shipment in a short time, after he learns how.

My soldering outfit consists of the following: A small trough for holding the pails, two soldering irons, bar of solder, kerosene stove (kitchen stove), a pint earthen jar containing a weak solution of sal ammoniac, bottle of 'Ruby flux" and a mucilage brush, pair of tin shears, piece of light tin, pointed tool and pair of pliers.

Soldering on bright tin is very easy and can be best learned by being shown, but the following directions can be used. Place the irons in the blaze of a kerosene, gas or gasoline stove. Make a weak solution of sal ammoniac in the pint jar. Cut straps ¼x1½ in. of light, bright tin, straighten them and apply flux to one end. Place the pail in the trough and put flux (or powdered alum) on the spot where the strap is to be soldered. Remove an iron from the blaze, test its heat by plunging the point in the sal ammoniac solution. The sound of an iron properly heated will soon become familiar. The solution cleans the iron for use. Irons can also be cleaned by being rubbed across a cloth. Now place the strap on the pail, the soldering iron on the strap, and touch the bar of solder to the tinned (or bright) part of the iron until enough solder has melted to solder the strap. Hold the iron on the pail until the solder runs (or "sweats") under the strap. As you remove the iron hold the strap in place for a moment with the fingers, or pliers, if it is hot. Soldering the straps inside the cover is identically the same process, except that some pointed tool is necessary to hold the strap in place until the solder hardens.

The advantage of having two irons is that one will always be hot for continuous work. Care must be taken not to overheat the irons, burning off the tinning. An iron not bright will not solder. It is then necessary to retin the iron, a difficult process with only a kerosene or gasoline stove, since the iron must be heated cherry red. Short irons can often be bought cheap from a tinsmith, and are just as serviceable as heavier ones after they are re-pointed and re-tinned, except that they will not hold the heat as long.

Although this article is not written in behalf of soldering, it is well to know how to solder and have an outfit just for use about the house. Much time, convenience and expense can be saved by doing one's own soldering.

Plymouth, Wis.

BEEKEEPING IN CANADA

In this issue we publish some pictures showing the apiary building at the Canadian Government Farms at Ottawa, and also those in charge of the work.

In Canada a Province corresponds to a State in this country. In the picture we show Prof. F. Eric Millen, who has charge of the beekeeping work for the Province of Ontario, together with Mr. F. W. L. Sladen, the Dominion Apiarist, who has charge of the work for the Government of Canada, with headquarters at Ottawa, and his assistant, Mr. C. B. Gooderham. The position occupied by Mr. Sladen and his assistant corresponds to that of the men in charge of beekeeping work in the United States Department of Agriculture in this country.

At Ottawa the work undertaken is largely experimental in nature, together with investigation of the honey plants, their range, season of blooming, etc. The Dominion Apiarist also has supervision of the bees at the various branch farms, in different parts of the Dominion.

BROOD, HEAT AND HONEY

By Will H. Gray

The experiments carried on last spring at North Lonsdale with electrically heated hives, while not extensive enough to be conclusive, were very interesting, because they showed very clearly the intimate relationship between brood, heat and honey.

The heating arrangement, consisting of a 6 candle power carbon filament lamp, was started on the 9th of February in each of three hives, and kept going till the middle of April. There was some brood in one at the beginning. A few hours after the heat was applied there were great signs of activity, and a continual scratching could be heard inside. Two colonies were given feeders, which they emptied in four or five days. Later a feeder was found to have been emptied in one night. On examination it was found that the lamp had burned out, hence the rapid consumption of syrup to keep up the heat.

The colony that was without a feeder liquified a large amount of honey and put it near the brood. They had not left the hive during this time. (If they had it would probably have been considered willow honey).

The most interesting part of the experiment was the saving of honey instead of the consumption of it, as would have been expected. This looks as if heat, brood and honey are interchangeable, which puts quite a pleasant aspect on this method, as the honey saved would probably pay for the heat supplied and the hive would be benefitted by the extra amount of brood raised.

All three hives were very weak, one had a poor queen and showed no benefit at all. One of the other two was divided at the end of May, as it then occupied two stories; they swarmed again about the middle of June. The remaining one became very strong.

The large increase in brood-rearing did not begin until the bees were able to fly. The heated colonies made use of many flying hours, while the unheated did not venture out.

British Columbia.

Left to right, Prof. F. Eric Millen, Provincial Apiarist of Ontario; C. B. Gooderham, Assistant to the Dominion Apiarist, and F. W. L. Sladen, Dominion Apiarist of Canada.

YELLOW INDIGO

The following letter from a New York beekeeper refers to the Yellow Indigo, **Baptistia tinctoria.** It grows on dry and sandy soils from New England and Ontario to Minnesota, and south to Florida and Louisiana. It is known by a number of local names, including wild indigo, indigo-weed, clover broom, shoofly, rattlebush, horsefly-weed, and Mr. Barteau adds bugle-weed, though bugle-weed is commonly applied to an entirely different plant.

Brookhaven, L. I., Aug. 20, 1920.

"I am enclosing you a branch of a weed known in this locality as 'bugle-weed.' I have never known it to be spoken of as a nectar-bearing plant. It grows on waste, sandy land, and most luxuriantly in burned over areas (woods). The plant grows about 2 feet high and has tremendous roots, going down three or four feet. It yields in all kinds of weather immediately after rain. Hot, dry days, with no dews at night, make no difference to it. The honey is water white, as mild, or milder, than clover. At this

season of the year there is usually a dearth, with nothing coming in whatever. A burnt over woodland has caused this weed to bloom this season in the greatest profusion.

My scale hive record since July 20 is as follows:

	Gain.	Loss.
July 20	11½	
July 21	13½	
July 22	8½	
July 23		4½
July 24		1½
July 25	10	
July 26	9	
July 27	15½	
July 28	17	
July 29	8½	
July 30	3	
July 31	14	
August 1	3	
August 2	9	
August 3	13	
August 4	10	
August 5	18	
	163½	6

Net gain in 17 days, 157½ pounds.

If this weed has not been mentioned it seems worthy of a prominent place."

E. M. BARTEAU.

HONEY PRODUCERS' LEAGUE

The American Honey Producers' League is the most important movement in the way of organization of the beekeepers ever yet instituted. It is the product of the best brains of our American honey producers. That it cannot function without the moral and financial support of the beekeepers is self evident. Any state or regional association which fails to provide for membership and to send a delegation to the next annual meeting in January will be making a mistake. If funds of your association are not available, by all means raise the amount of subscription. Do not get the notion that the League is a sectional affair. It is national or international in its scope. Its policy under the constitution, will be determined by the delegate membership, and be sure **your** Association is represented. A permanent Secretary has not yet been selected. The President, Mr. E. G. LeStourgeon, San Antonio, Tex., will be able to furnish copies of the constitution and other literature. Write for them.

E. S. MILLER.

Valparaiso, Ind., Sept. 6, 1920.

A NEW HONEY PLANT

Jes Dalton, of Louisiana, sends us a specimen which has furnished a good honey flow the past season. It is Lizard's tail **(Saururus cernuus)**, called in some places swamp lily, or breastweed. It grows in swamps or on muddy banks, and is found from New England and Ontario to Minnesota south to Louisiana and Texas. There are many plants common to the swamps which are the sources of honey, which the beekeepers have not yet learned to recognize, and we are glad to receive specimens of this kind. This plant is a marsh herb, growing from one to four or five feet high, with slender rootstocks, jointed stem and ovate or heartshaped leaves. The small white flowers are crowded together on long, dense spikes. Mr. Dalton writes that this year it began blooming before the close of the spring flow and carried the bees over the season when they usually have a dearth until the summer flow came in July. By overlapping both the usual spring and summer flows it gave a continuous season from the time spring opened till the close of the summer flow. He states that although there are hundreds of acres of it near by, he has not known it to yield before, and he wonders whether it will come again. He says that it yields very freely a fine-flavored, yellow honey of unusual color, and that it would be of inestimable value if it could be depended upon to yield every season.

We will be glad to hear from any of our readers who have been in the vicinity of swamp lands as to whether they have had flows from this plant, and if so, whether it yields frequently.

ANOTHER REMEDY FOR STINGS

I have tried about all the remedies for stings, but the juice of an onion is the best of all. If the juice is squeezed directly on the wound immediately and kept up for a little time, there will be no swelling. When stung in the mouth an onion chewed up and held in the mouth is an effective remedy.

We cut a bee tree a few years ago in August. There were six combs 10 inches wide and 5 feet long, with every inch filled with sealed brood, but not a quarter of a pound of honey.

ANDREW MILES.

Indiana.

ROCHESTER ATTEMPTS TO OUTLAW BEES

Some time since, Alderman Morgan, of the Nineteenth Ward of the city of Rochester, N. Y., introduced an ordinance prohibiting the keeping of bees within the city limits without the consent of all persons living within 200 feet of where the bees are kept.

The Monroe County Beekeepers' Association, through its officers, at once protested. J. S. Bryan, Vice President of the organization, has employed an attorney to represent the beekeepers in opposing the passage of the ordinance. Rochester is one of the cities where the National, in the days of its usefulness, fought a legal battle to secure the discharge of a beekeeper arrested for keeping bees in violation of a city ordinance. At that time the court ruled the ordinance unconstitutional and the defendant was acquitted. It is interesting to note that this same city proposes to try the same experiment again, after many years of time, in spite of numerous court decisions to the effect that an ordinance declaring bees to be a nuisance, whether they be so in fact or not, is null and void.

The matter will come up for hearing in due time, though we anticipate that the ordinance will not be passed. The following remonstrance has been filed with the law committee of the common council by Attorney Bryan, in co-operation with President Gordon Dye and Secretary Frank Pillsbury of the association:

Rochester, N. Y., July 30, 1920.

Law Committee, Common Council of the City of Rochester, Rochester, N. Y.:

Gentlemen: In behalf of the Monroe County Beekeepers' Society, I herewith present and file the following objections to the passage of the ordinance introduced by Alderman Morgan relating to the keeping of bees within the City of Rochester:

1. Bees are not a nuisance.

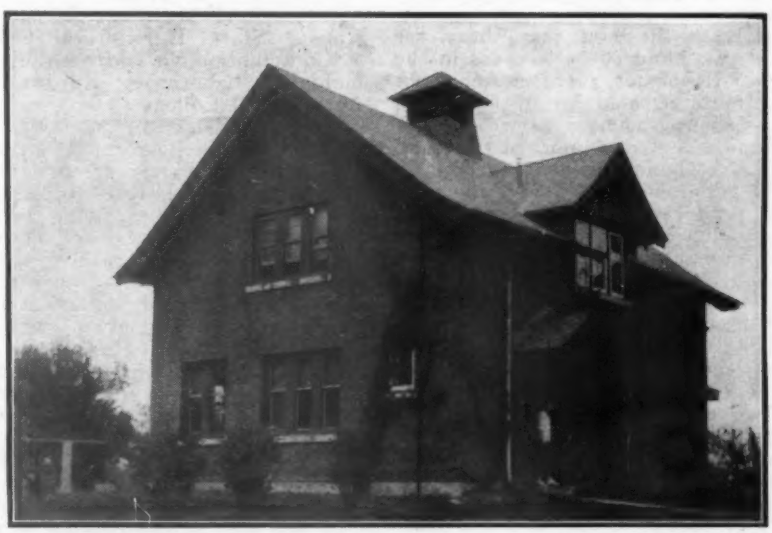
2. The question of nuisance is one to be judicially determined in each case.

3. The proposed ordinance attempts to declare the keeping of bees a nuisance without regard as to whether or not bees in general have become a nuisance within the city.

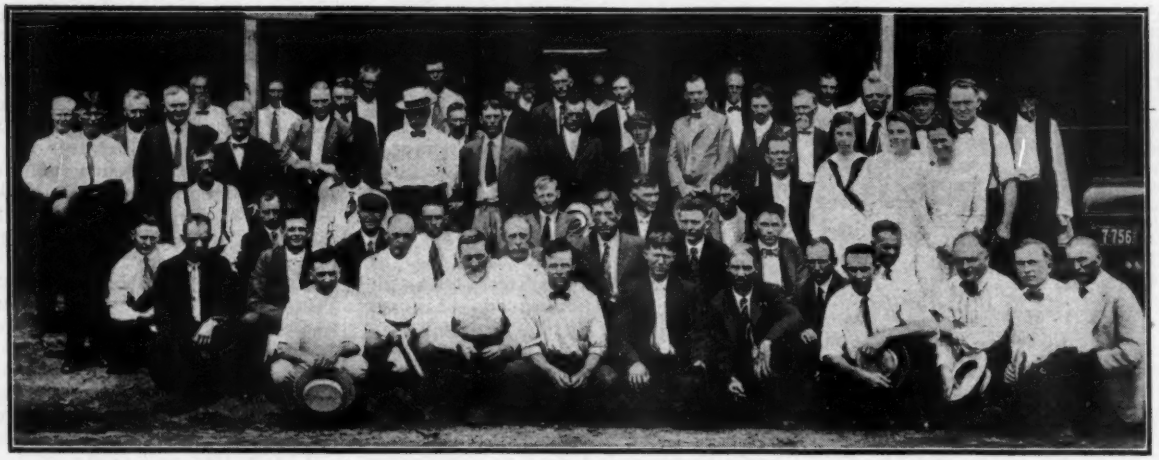
4. There is no proof of the necessity of such an exercise of police power as contemplated.

5. That the passage of the proposed ordinance would be an unlawful interference with the rights to pursue a lawful business.

6. That the passage of the proposed



Apicultural building at the Canadian Government Farms at Ottawa.



First convention of the Georgia State Beekeepers' Association, recently organized at Waycross.

ordinance is legislation directed against the owner of bees and not against the bees themselves and would not in any way control or eliminate the alleged danger and that transient bees, vagrant swarms of bees, wild bees, sweat bees and hornets, which are uncontrollable, would be and are more dangerous than the domesticated bee which has received care and attention from beekeepers.

7. That bees in themselves are not dangerous, and will not sting or annoy until attacked.

8. It has been judicially determined that the keeping of bees in the City of Rochester is not a nuisance.—City of Rochester vs. Taunton. Decision of the Police Court held that the enactment of a similar ordinance within the City of Rochester, which was introduced by former Alderman William Baker, of the Tenth Ward, was illegal and unconstitutional.

To show you how rarely dangerous bees are, I desire to call your attention to the fact that there are two hives of bees immediately back of the store on Spring Street, occupied by Alderman Morgan, the introducer of this ordinance, and yet I am quite sure that he or no one else knows about them being there except the owner.

Passing from the legal phase of this question, I desire to call your attention to the fact that there are about two hundred beekeepers in the City of Rochester, representing about five thousand colonies of bees, and they produce, as near as we can determine, about one hundred thousand pounds of honey, valued at about 27 cents per pound. Honey is the only food produced which is completely prepared without the assistance of man, animal or other insect, and nothing touches it in the process of securing it and preparing it for human food except the bee.

To destroy this immense amount of food secured by these little insects in the City of Rochester because one or two persons were stung by bees through their own acts, would be almost uncalled for, and it seems to me a willful waste of food, which would add to our already great burden of the high cost of living. It is the elimination of one food product which causes the increased demand for another and the elimination of one hundred thousand pounds of honey from the City of Rochester would certainly mean an increased demand upon sugar and a consequent raise in the price of that commodity.

Besides the loss in food, there would be even a greater loss in the pollenization of fruits, flowers and vegetables, and little or no fruit, flowers or vegetables could be grown without pollenization, the greatest method of which is the bee itself. Not a hothouse used for growing cucumbers could succeed without bees unless by the long and laborious process of touching each little blossom with a hair brush and thus pollinating them. I suggest that you verify this by asking Mr. Rudman, of Irondequoit, or Mr. William Craig, of the penitentiary, about the value of bees in growing fruits and vegetables.

I therefore, in behalf of the beekeepers of Rochester as represented in the Monroe County Beekeepers' Society, ask that said ordinance be disapproved of and its passage denied.

All of which is respectfully submitted.

THE IMPORTANCE OF WINTER STORES

By J. H. Merrill, Apiarist*
Kansas State Agricultural College.

*Contribution No. 58 from the Entomological Laboratory, Kansas State Agricultural College.

I received a letter from J. E. Crane in May, in which he made some observations on winter protection. In his letter he makes the two following statements: "With good winter packing I have had, for nearly 50 years, satisfactory results, except when my bees have had poor stores from honeydew or other sources, when even winter packing will not save all of them." He further said that "With early, well-ripened honey, and plenty of bees, a colony will stand almost any kind of cold for a time, but it pays, and pays well, to use winter packing where it can be had."

As reported on page 334 of the American Bee Journal for October, 1919, and also in the Journal of Economic Entomology, pages 99 to 111, Vol. 13, No. 1, an experiment to determine the best form for winter protection for bees is being carried on at the Experiment Station of the Kansas State Agricultural College. In the articles above mentioned, the value of a windbreak, the superiority of a two-story over a one-story hive for wintering, and the value of packing are clearly shown. During the winter of 1919-1920 this experiment was continued, and when, on the 19th of May, the bees were weighed to determine which form of wintering had been best for them, some additional factors were found to have entered into the experiment that were not present in the first two years' work. These bees were put into winter quarters on Octber 4, 1919, with a known amount of honey and a known number of bees in each hive. Sufficient stores were left in each colony to carry them through any ordinary winter, and up to the beginning of the honey flow. On the 5th of April the temperature at Manhattan dropped to 5 above zero. This low temperature was accompanied by a heavy snow storm. As a consequence of this unseasonable weather, the flowers on which the bees would ordinarily depend for spring food, were killed; consequently, they were forced to exist on the stores which were left in the hives in the fall. One colony, between October 4 and May 19, consumed 52⅜ pounds of honey, after which it was fed two half-filled frames of honey and 6 pounds of sugar. This will explain why some of the colonies became short on stores before they were weighed in the spring.

During the winter, daily weights were taken and recorded. On the 19th of May, 1920, the number of bees, the amount of brood, and the amount of honey were again determined. This date is two weeks later than the one on which the bees were weighed in 1918-1919, and each colony should have shown several thousand more bees this year on the 19th of May than it did last year on the 4th of May. In 1918-1919, the one-story unpacked hive in the windbreak gained 313 bees, while the packed hive in the windbreak gained 24,844, but during 1919-1920, the one-story unpacked

hive in the windbreak gained 10,000, while the packed hive, similarly placed, gained only 3,700. In 1918-1920, the two-story hive in the windbreak gained 5,936, whereas in 1920 it gained 8,125. These results would seem to overthrow any evidence that we may have had in the past as to the value of winter protection, especially when we consider the fact that the packed hive in 1918-1919 had 24,331 more bees than the unpacked hive, while in 1919-1920 it had 6,300 less. This would seem to indicate that the packing had not been of any great value to it, especially when the unpacked one-story hive had five frames of brood, while the packed hive had only three frames. Had it not been for the fact that daily records of the changes of weights were kept, these results would have been very disconcerting, and extremely hard to account for, but upon turning to the daily record we found that on April 20 the packed hive reached its lowest weight. From then until the 19th of May the gains and losses ranged from nothing up to an eighth of a pound, showing that on April 20 the winter stores were exhausted in that colony, and from that time forward they were barely able to secure enough nectar from the field to even maintain the existence of the colony. On the 19th of May, when the colony was weighed, no honey at all was found in the packed hive, while in the one-story unpacked hive there remained 3½ pounds of unconsumed stores. The unpacked hive had five frames of brood, whereas the packed hive had only about three. To all ordinary appearances, the packed hive was a good, strong colony of bees on the 19th of May, and anyone would have been justified in thinking that it had wintered well. However, when the fact is taken into consideration that during the previous year this colony gained 24,844 bees between the fall and spring, and this year only gained 3,700, we can see that something was radically wrong. As the one-story unpacked hive contained 5 frames of brood, while the packed hive only had three frames, we can understand why this weakened condition was brought about. On the 19th of April, when the stores were exhausted, the queen in the packed hive did not lay as many eggs as the one in the unpacked hive. To all appearances this colony had wintered well, yet when we consider that the date of weighing was two weeks later than the previous year, and that during these two weeks the queen should have deposited from 30,000 to 40,000 eggs, which would have filled six to eight frames of brood, when as a matter of fact it only had three frames, it showed plainly that the queen was seriously affected by the shortage of stores. Had we not the daily records of the changes in weights in these colonies, we would never have known why this colony did so poorly. Although in this article I have spoken of one colony, the same fact holds true for the rest of the colonies which became low in stores.

When the one-story unpacked hive in the windbreak is compared with the one-story unpacked hive in the open, the odds in the number of bees gained, and in the amount of brood are largely in favor of the one protected by a windbreak. Both of these hives had unconsumed stores when the spring weighing was made, but the hive in the windbreak had consumed 9 pounds more than the one in the open, which it had used in brood-rearing. The one in the windbreak had five frames of brood and gained 10,000 bees, while the one in the open only had 3 2-3 frames of brood and gained 575. The fact that the packed hive in the open gained more than the unpacked hive in the open, both in number of bees and the amount of brood, demonstrated that, with other things being equal, packing was of a distinct advantage. Here again was shown the value of a windbreak over no windbreak, and, as in the open, the two-story unpacked hive gained 8,000 more bees than the one-story unpacked hive, the superiority of the large hive over the small one for wintering was shown. The superiority of the packed hive over the unpacked hive in the open again showed the value of winter protection.

Some valuable deductions can be made from these results, some of which are: When a colony has insufficient stores, even though it may apparently winter well, yet the queen will so far slow down in her work as to seriously weaken the colony far below the strength that it would have been had it been supplied with sufficient stores. Mr. Crane's statement that if bees are supplied with plenty of honey "they can stand almost any cold for a time," and also his contention that without stores winter packing will not save them, are both strikingly borne out by the above figures. When considering the question of wintering bees, too much emphasis should not be placed on any one feature of wintering. We know that we must have a large number of young bees; that we must have plenty of stores, and also that if we can give our bees the added value of a windbreak and winter protection, it will well repay us, but no beekeeper should rely on any one of these factors alone and expect to get the very best results. They are all necessary.

SWEET CLOVER

The world has suddenly found that sweet clover is a valuable forage plant. Beekeepers have tried for a generation to overcome the great prejudice against it. Farmers fought it as a weed and lawmakers legislated against it until it seemed the task of educating the public to its true value was well nigh hopeless. The past few years have seen a wonderful change in sentiment and recent months have developed such a demand for seed as the most optimistic had hardly dared hope for.

Now that sweet clover has demonstrated its value, both as a soil builder and a forage plant, large areas of new honey-producing territory will rapidly open up. Great interest is manifested in better strains and we may shortly look for a blooming period from May until frost. The announcement that Professor Hughes had found an annual variety led to such a demand for seed that it was only possible to send it out in small packages of a few ounces, when the planters wanted bushels, yet thousands were disappointed and failed to get any seed. A letter from Professor Hughes states as follows:

"You will be interested in knowing that we sent out something over 45,000 small samples of seed of the annual sweet clover this spring, and that we had hundreds and thousands of requests for larger quantities at almost any price which we might ask. We, of course, had no seed for sale. When we made announcement regarding this clover we stated that it did not originate here. We stated that it was our opinion that the original mutant from which this clover has apparently come, occurred somewhere on wild land in the south."

Professor Hughes further advised us that he was in touch with two men in Alabama who had sent him samples which established the fact that the plant was growing there in the wild state. He has since made a visit to that section to investigate the extent of growth, and seedsmen will offer the seed in larger quantities as fast as it can be obtained.

With the general introduction of the annual sweet clover it can be seeded with small grain, leaving time for the plant to mature after the

Apple orchard and apiary of Tsunekichi Ishii, of Japan.

small grain has been removed. This will not only add greatly to the production of the grains through soil improvement, but it will increase the area of bee pasturage by untold thousands of acres.

Another Variety

The thing of latest interest is an early blooming variety of the biennial sweet clover. Last May, as Henry Dadant was making a journey to the outapiaries he was surprised to see a few plants of sweet clover in full bloom. Since it seldom reaches its period of bloom so early, he began investigating to see whether there was a strain which might be used to fill in the gap following fruit bloom, when the bees have no nectar available. From County Agent J. H. Lloyd, of Hancock County, he secured the following information:

"Mr. Foot has called my attention to a paragraph in the circular letter from Grundy County as follows:

'A new type of two-year white blossom sweet clover has been grown in Grundy County for the past few years. The direct origin of this is not known; however, it is very evident that this sweet clover is distinct and different from the large, coarse and later maturing white blossom sweet clover. The Grundy County sweet clover is nearly three weeks earlier in maturing, is shorter, growing about waist high on the average; is a heavy seed producer and ripens more uniformly. It has several advantages over the large sweet clover, although for soiling purposes it is hardly as good. Fields of this variety of sweet clover may be seen on the farms of Clifford Collins, northeast of Morris; Maurice Walsh, northeast of Mason, and Robert McLuckie and James Huml, southwest of Coal City. The Grundy County sweet clover will soon be ready to harvest for seed. (July 13). This type and the large growing kind may both be seen on the farm of Alex Bell, three miles southeast of Morris. "

With an annual variety which blooms the same season the seed is planted, and early and late blooming varieties of the biennial variety, the beekeepers may hope for greatly increased honey flows in the sweet clover districts. A mixture of the seeds of all these varieties, sown on waste land will give bloom every year, and for a long period. Where farmers sow for permanent pasture, as some are beginning to do, a mixture will insure better results for the farmer as well as the beekeeper. The great interest in the plant on the part of the farmers of the country offers unlimited possibilities for beekeeping over a very large area.

The American Bee Journal hopes to be able to secure some seed of the early blooming variety for trial next season.

ANNUAL SWEET CLOVER

A Testimonial

Last fall I secured from the Henry Field Seed Co. two ounces of the Annual White Sweet Clover. I shipped the seed to my father in Italy, asking him to pay it the best of his attention and care. Confident that you would be glad to hear the result, I herewith transcribe the following from his letter, just received:

"The annual melilot sowed by me on the 15th of April is all in bloom, notwithstanding the drought, which has never been equaled here. The bees come to it extraordinarily, and at all hours of the day. It has reached the height of 1.50 meters (557 inches), July 9, and none of our peasants has the least idea of this plant with its millions of flowers. I will take care of gathering its seed."

Don't you think that such results have been very satisfactory and encouraging, in spite of the unfavorable conditions? D. BARONE.

New York City, Sept. 1.

BEES KILLED BY SMELTER SMOKE

Camp Verde, Ariz., Aug. 15, 1920.

Will you please make a correction of the article by Kennith Hawkins on page 275, August issue of the American Bee Journal, entitled, "Bees Killed by Smelters?"

The "complete investigation" made by the State Entomologist and Plant Pathologist, under instructions from Governor Campbell, was a hurried visit to some eight or ten apiaries, scattered over an area of 30 miles in length, all made inside of two days. Somewhere near 1,000 colonies of bees are involved, owned by four different parties. Any investigation of any value, over that of the practical beemen who are being injured, would have to extend over at least several months and be conducted by men familiar with the practical side of the business. The smelter people are spending what has been estimated by those outside as at least $40 per day for several months, in an attempt to prove that their smelters do not injure crops or bees.

The charge "that sulphur is deposited in the bloom of honey plants which are visited by bees and that this causes the honey to taste like a good variety of parlor matches," is evidently a part of that "excellent write-up of the case" in the last Los Angeles Times, and is a fair sample of the journalism for which the American people are paying such a price, and getting so much rot.

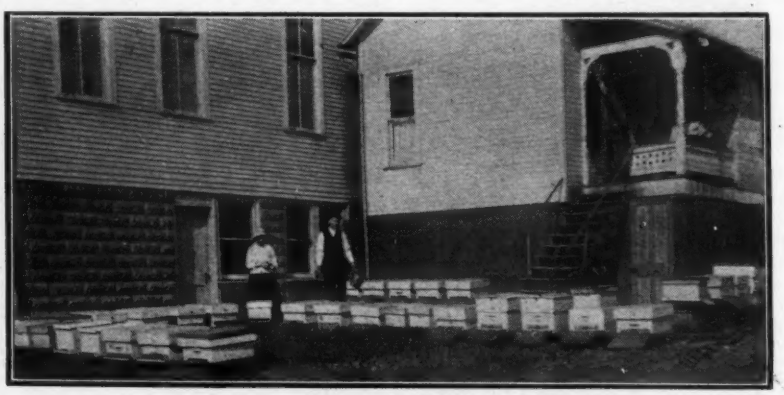
The facts in the case are that, if our honey has any sulphur in it it would take a chemical analysis to show it. The quality, to all appearances, is as good as it ever was. Our only complaint is that, from some cause not yet fully determined, our adult bees disappear just when they would be useful in gathering a crop. This is not a new condition, by any means, but has occurred in other localities where smelter smoke has driven, in one instance, as many as 10,000 colonies of bees out of business. A case is to come up in the Federal Court of this District, in September, instituted by one of the beemen of this section, which will be one of the most interesting cases of its kind that has ever come into court. Three different State Bee Inspectors have, in the past four years, given us a clean bill of health for our bees, as far as any disease is concerned. Unless the smelters put on some method of removing the poisonous matter from their smoke we will be compelled to give up one of the best bee ranges in the State and move; but where, is the question? L. B. BELT.

Arizona.

LATIN NAMES OF PLANTS

By E. G. Baldwin

In the July issue of the good old American Bee Journal, page 229, appears an editorial on the terminology of English scientific names, apropos of the Latin name for white sweet clover. Attention is there called to the fact that the Italians call the plant "Melilotus albus," while the English-speaking races say "Melilotus alba." "Ye editors," in the editorial mentioned, commend, in passing, the ending "us" of the Italian usage as being the correct form, and add as their reason for so doing: the termination "us," of melilotus, is masculine, the termination "a," of alba, is feminine, etc. While our own Latin days are not so far past, may we suggest that the statement regarding adjectives is quite correct; "us" in an adjective, is always and only masculine, "a" always and only feminine; but nouns, on the contrary, are not always governed in their gender by their terminal syllables. Certain rules govern gender of nouns, by meaning, not by endings. For example, names of males are always masculine, names of females always feminine, even if the



Mr. and Mrs. George W. Burdette, in their apiary at West Union, West Virginia.

male noun ended in "a" or the feminine in "us," and so, a noun ending in "us" might be masculine, feminine or neuter by meaning. Now names of germs, trees and plants were regularly feminine by meaning. For example, Eucalyptus (the eucalypt tree) is regularly feminine, and our English nomenclature has "Eucalyptus robusta" for one of the species, and so the word "Planus" (Plane tree) regularly the adjective of its species ending in "a." Thus is the customary usage in English botanical terms, though there are some variations that seem inconsistent, to be sure, as the editors maintain.

But for the reasons given, "Melilotus alba" is undoubtedly better Latin than "Melilotus albus."

UDO TOEPPERWEIN

By E. G. LeStourgeon

Very suddenly, on the morning of Saturday, August 7, Mr. Udo Toepperwein passed away. A slight scratch from a mesquite thorn which he had received a short time before, became infected and blood poison developed.

Older beekeepers will remember a time, not far distant, when the name of Udo Toepperwein was the leading name in Texas beekeeping. His establishment was the sole source of supply. He developed the markets for honey, which we still enjoy. His labor and energy earned for him every office in the gift of the Texas State Beekeepers' Association, and he served his State on the directorate of the National Association, attending many of its meetings as a delegate. It was chiefly through his efforts that the 1907 convention was held in San Antonio.

Udo Toepperwein was a loyal friend, an enthusiastic beekeeper and a good neighbor. His loss will be keenly felt, as he was still a young man, being but 42 years old at the time of his death.

SUMMER MEETING OF TEXAS HONEY PRODUCERS' ASSOCIATION

Educational Section

During the Texas Farmers' Congress, held at the A. & M. College, August 9, 10 and 11, the beekeepers of the State met in their 28th annual meeting. This session was marked by features that made it one of the greatest that has ever been held. The beekeepers' section of the Farmers' Congress had more enrollments than all the other sections put together. In fact, the Farmers' Congress was a beekeepers' meeting. On account of the growing interest in the bee business and because of the requirements of the newly formed Honey Producers' League for representation in that body, it was thought best by the beekeepers to return to the old name of the association. So, by vote of the society, this body is now officially designated as the Texas Beekeepers' Association. This gives the State a legal representative in the new league.

Among the papers presented and worthy of notice was the report of Willis C. Collier relative to the meeting of the American Honey Producers' League. Mr. Collier was a representative appointed by this Association, and his report was adopted and commended by a unanimous vote.

The reports of E. G. Le Stourgeon, President, and Miss Alma Hasselbauer show such material progress of the Texas Honey Producers' Association that it strengthened the report of Mr. Collier as to what the nation-wide associations of similar kind could accomplish. The successful growth from 15,000 to 65,000 in four years was sufficient to convince anyone of the achievements of the Association.

Mr. W. O. Victor, of Uvalde, the veteran bee king of Texas, gave an account of his experiments in moving bees from Texas to the North in refrigerator cars, in summing up over 30 years' experience in shipping bees a long distance.

Dr. M. C. Tanquary gave a report of the progress of the apiary inspection work, showing the change of policy of the Department. This change has already been partially effected. Under the new order, all inspection work is done directly by men sent out from College Station, inspection being carried on only where disease is suspected. The inspectors are empowered to use their time in the treating of all disease found, and have ample authority to carry out the full measure of the law.

The paper on the combless package bee business by E. B. Ault, of Calallen, was read by the Secretary. Mr. Ault is one of the pioneers in shipping combless packages.

The paper of Mr. E. G. Le Stourgeon, who was sent as a representative of the Texas Honey Producers' Association to the American Honey Producers' League, and who returned having been elected its first President, was considered by all as the finest paper given during the meeting. Mr. Le Stourgeon briefly described the beekeepers' activities in Texas during the past 25 years, concluding with what they accomplished in the forming of a co-operative association for marketing and buying. He called attention to other such associations in other States and to the condition of the honey business and market in those States in which no such associations exist. He then mentioned briefly the occurrences which brought about the forming of the new league, and drew a picture of the future of the league as foretold by the success of the associations in Texas, California, Colorado and other States. The applause that followed his speech indicates that the League has no lack of support among the Texas beekeepers.

Among the other papers of importance was one by E. E. Rippert, the new Extension Service Entomologist, on the economic aspects of agriculture. It was voted to request that this article be printed in the American Bee Journal. The final session of the meeting was held in the experimental apiary. The work was in charge of C. S. Rude, State Inspector of Apiaries, and H. B. Parks, State Apiculturist. Demonstrations illustrating the treatment and control of foulbrood were given. An experiment under way in apiary No. 1 was exhibited to the beekeepers.

The beekeepers left College Station carrying with them this slogan: "The meeting next year with 500 present and all beekeepers."

A GOOD BEE COUNTRY

By Amos Burhans

While on a recent vacation trip into that great country of agricultural and other opportunities called the cut-over lands in northern Wisconsin, I made the acquaintance of Postmaster Brown, of Minong, who is building up an apiary that now numbers over a hundred and twenty-five colonies.

The one thing that claimed my attention in this apiary more than anything else was the superiority of the pure bred Italian bees over the black and hybrids. I visited this section about July 1. The white and red clover bloom was at its height. Wild flowers and other blossoms were everywhere in abundance. Mr. Brown's Italians were in ten-frame regular Langstroth hives and almost perfect weather prompted them to great work in the fields. Seven of his Italian colonies were gathering what apparently looked like twice as much honey as any of his strongest hybrid colonies.

In getting started Mr. Brown bought several dozen colonies of hybrids, which he is increasing by swarming and dividing. He is requeening all with pure breds as fast as possible. He had 60 queens on the way to him, which will give an idea of the extensiveness of his operations and work.

Much of the equipment he secured with the purchased hybrids and all of which he plans to abandon, was 8-frame size, too small for commercial honey production on the scale he is working towards. Mr. Brown has 20 odd colonies in Minong, on the home premises, and nearly one hundred in his outyard three miles east of town. He has put a good many years of study into the handling of bees, but only lately began pushing the work for profit. There is basswood, goldenrod, berry bloom of all kinds, buckwheat everywhere, and more and more clover of all kinds every year in this section.

Land and lumber in this country are much cheaper than elsewhere, and it is a surprise to me that more beekeepers do not discover it or develop in it. A few cows, some root and grain crops and poultry would provide a generous living. Fuel can be had anywhere for the asking and cutting up.

This combination, along with some big, strong colonies of Italians to reap the honey harvest that abounds, would insure independence and relief from financial worry. It is a wonder that more suburbanites and city workers do not find modern beekeeping and small farming a route to security and peaceful life.

SUMMER MEETING OF NEW YORK STATE ASSOCIATION OF BEEKEEPING SOCIETIES

Over 500 beekeepers of New York and surrounding States, together with their families, spent August 6 at the home apiary of Archie Cogshall, at Groton, N. Y., where an extensive program was presented. Aside from a number of New York beekeepers who appeared on the program, Ernest Root, of Medina, Ohio and Kennith Hawkins, of Watertown, Wis., spoke to the assembly. Mr. Root gave the resume of experiments being carried on in shipping bees and investigations of the food value of honey. Mr. Hawkins reviewed impressions of the honey crop following a month's tour of 11 States which ended at New York.

Dean Mann, of the College of Agriculture, Cornell, reviewed for the members the efforts being made at Cornell University intended to benefit New York beekeepers. George H. Rea, federal extension man for the State, spoke in his inimitable way of conditions in the State and projects being considered. The chief apiary inspector from the State Department of Agriculture at Albany, reviewed the disease situation in New York, while S. D. House, O. L. Hershiser and other New York beekeepers talked on efforts toward beekeeping legislation and prices recommended to beekeepers of the State for their honey crop. A feature of the day was a picnic luncheon served in Mr. Cogshall's orchard and the reunion of New England beekeepers. Cornell University has a number of excellent projects "up its sleeve" which are being unanimously backed by all the progressive beekeepers of New York. Members' reports indicate a fair honey crop in New York this year, with the State "spotted" with drought affected areas.

A GOOD START

I started with one colony of bees when 16 years old. I am now 22 and have 52 colonies, after making up for the heavy loss last winter. This year's crop will be 100 pounds of white honey (clover and basswood) per colony.

ROBERT G. NORMBERG.

Minnesota.

PRICE CUTTING

By A. C. F. Bartz.

Of all the ills the beekeeping industry suffers from, there is, according to the views of the writer, none more detrimental than the one known as price cutting.

It seems that honey, at one time pronounced a fit food for the gods, fate has now decreed to go through the land a beggar, striving in vain to gain the attention and popularity it deserves and enjoyed in older days. But the most discouraging feature of the deplorable situation is, that so many honey producers are satisfied to work for little or nothing, just as long as they can get rid of what they produce. And after they have sold their crop they declare they could have sold a lot more if they had it, when in reality it means that they could have given away a whole lot more.

A careful account kept for the last twenty years shows the average crop of surplus per colony is 40 pounds. And the last ten-year period, ending in 1917 and including that season, shows that it costs 30c per pound to produce honey in this section of the country. But the price of labor and commodities, excepting honey, have increased somewhere around from 25 to 50 per cent since 1917, which makes the cost of honey production considerably higher than above stated.

It is true, the methods of honey production are also improving, but nevertheless, the cost of production is far above the selling price. It is ridiculous to pay a hired man $5 per day for an 8-hour day, and the beekeeper work sixteen hours at $2.50 per day, and in addition furnish a $5,000 equipment

The Chippewa Beekeepers' Association, at a meeting held at Chippewa Falls, Wis., on the 22nd of June, decided to improve conditions, locally at least, by conducting a honey advertising campaign, and agreed to institute a honey cooking, baking and candymaking contest, awarding premiums as follows: $3 each for the first prize on the best article of cake (any kind), cookies, pie, beverage and candy; for the second prize, $1 for the third, and 50c for the fourth.

The money to carry on this campaign is obtained by the beekeepers of this association by a 2c per colony assessment, on the fall count of colonies. The contests are to be held in different parts of the county. The first one was held in Chippewa Falls, Chippewa County, Wis., during the latter part of August.

Wisconsin.

Squibs From the October, 1870, Number

"The yield of honey by various plants and trees depends not upon the character of the season but on the kind of soil on which they grow." (If this statement is true how can we account for the different results of different seasons?)

"A good swarm of bees, put in a diminutive hive, in a good season, may be compared to a powerful team of horses harnessed to a baby wagon, or a noble fall of water wasted in turning a petty waterwheel."—Langstroth.

"The smell of their own poison produces a very irritating effect upon bees. A small portion offered to them on a stick will excite their anger."

"Bees sometimes abandon their hives very early in the spring or late in the summer or fall. They exhibit all the appearance of natural swarming; but they leave not because the population is crowded, but because it is either so small, or the hive so destitute of supplies that they are discouraged or driven to desperation. I once knew a colony to leave a hive under such circumstances, on a spring-like day in December. They seem to have a presentment that they must perish if they stay, and instead of awaiting the sure approach of famine, they sally out to see if something cannot be done to better their condition."—Langstroth.

"In bee culture the chief factor is intelligence, and not capital. The former must produce the latter."

"After a swarm of bees is lodged in their new hive, they ought by all means to be allowed to carry on their operations for some time without interruption."

"Light colonies, deficient in honey, should be fed in the latter part of September or early in October. If feeding is done early, in some seasons where late forage is abundant, there will be a great waste of honey."—Langstroth.

THE EDITOR'S ANSWERS

Questions are answered in order received. As we receive more questions than we can answer in space available, two or three months sometimes elapse before answers appear.

Giving Combs to Bees to Clean

1. I am extracting honey. I notice a lot of honey sticks to the comb. Should I put these frames back on the hives and let the bees clean the honey off?

2. When I take them off again in 2 or 3 days, to stack them away for the winter, what must I do to keep the bee moth out of the combs?

3. What is the best way to get honey out of old, dark combs, for wax?

4. I melted comb and honey all together in a capping melter. I noticed after the honey came off from the separator can that it was very dark and thick. What can I do with it?

ILLINOIS.

Answers.—1. Yes. Put them back on the hives in the evening and leave them on long enough for the bees to clean them. Some people have trouble with the supers in this way, finding that the bees store honey in them again. In that case, if you wish them to remove the honey to the brood-combs, just place the supers under the brood-chamber. You might do so in the first place if there was no danger of robbing. But when you put supers that are wet with honey under a hive, sometimes they are too much excited to fight the robbers. After the supers have been on top for a few days there is no more occasion for excitement. However, if you put the supers under the brood-chamber late in the evening it is quite probable that the bees can clean them before morning. Use care, however.

2. If you take them off before cool weather comes you should place them in a closed room and use either sulphur fumes or bi-sulphide of carbon, as advised in former issues of this magazine. If you leave them on till after frosts, there will be little danger of moths.

3. To get honey out of old combs, use the extractor. Some of the finest honey that we ever harvested was taken out with the extractor from combs that were almost black. Then give the combs to the bees to clean out and afterwards you may render them into wax.

4. Honey that has been spoiled in this way is not fit for much. You may be able to sell it to tobacco manufacturers, for they use almost anything in the way of sweets for chewing tobacco.

Wintering—Moving Bees

When ought I to place bees under a shed for winter, to be packed with leaves? How prevent loss by moving? How move them back in the spring? WISCONSIN.

Answer.—These questions are tangled together, for the very matter of moving colonies back and forth sometimes causes more loss than leaving them separate. That is why so many people keep their bees the whole year in their winter cases, and it is also the reason why beginners, who do not know of colonies losing bees by "drifting," lose the weak colonies, since their bees drift to the stronger ones.

Bees know the exact spot where their hive is, after they have taken one flight. If you move it, you must in some way call their attention to that fact, so they may take note of the change. Our way is to disturb them greatly and release them, while disturbed, so they may take note of the change. A slanting board in front of the entrance compels them to turn and look back.

Move your colonies together early, say in late September or early October. Then pack them. Move them back after they have had cleansing flights, otherwise the tired bees might not return to the new spot. But, better than all this, try to keep them close enough together, say in lots of 2 or 3, so that you may not have to move them back and forth every season.

Honey and Kerosene

I have about 30 pounds of this year's honey. I am only 10 years old and own 3 colonies, which I made of one, and the bees will not have enough to winter on without it. I had it extracted and the can it was put in had kerosene in it. Will it hurt the bees, and will they accept it? OREGON.

Answer.—I have never had any experience with honey and kerosene mixed. If the honey has only the flavor of kerosene and not any quantity of it mixed in, probably it would do no harm to the bees, if they take it. It may be they will refuse to take it. Try to feed it to them. It is a mistake to make too much increase, and if you become an experienced beekeeper, which you are likely to be, you will find that it is usually an error to try to more than double your colonies in a season.

Sour Honey for Feeding

Please inform me whether or not it is safe to feed old honey, a little sour, to bees in the fall when there is no flow of nectar for their winter supplies, and at what time to feed it. INDIANA.

Answer.—No, it would be unwise to feed to bees, for winter, honey which is sour, although if the winter should be mild they might not suffer from its use. If the winter is severe, they would probably die of diarrhea Better keep that honey to feed in spring, and if you must feed for winter, use sugar syrup.

Honey Above the Hive—Fruit for Bee Feed

1. I have a colony of bees which is storing all their honey in a super, and none in the brood-chamber. Will it be best to let the super stay above the brood-nest, or would it be best to put this super under the brood-chamber? There is no honey in the brood-nest, and but little brood. If I put the super with the honey under the brood-chamber will they move the honey? I have two hives in this same condition. My bees are working on goldenrod.

2. I find that a lot of my bees are working on peaches which are decaying. Will they convert it to honey, or what will they get from the decayed fruit?

3. If I let the super which has the honey stay on the hive above the brood-nest, will it be too far for them to get it in the winter time?

4. I have a house built out of poles, daubbed inside and out with clay mortar. Will this be a good place to winter my bees inside? I am using it at present to cure tobacco, but will finish in another week. NORTH CAROLINA.

Answers.—1. If you place the supers under the hive, the bees will move the honey to the higher story, for they dislike to have their honey between them and the entrance, as they cannot defend it so easily against robbers. But when the honey is sealed, they sometimes hesitate a long time to move it. As you live in a comparatively warm climate, it might be safe to leave the super at the top.

2. Peaches and other fruit make very poor food for bees. It is not honey, and it rarely ripens enough to keep from souring. So it would be advisable to extract that bad food before winter and to feed granulated sugar dissolved in half of its weight of water. That should be done before cold weather.

3. Honey in a super above the brood-nest may be in convenient position for the bees, if there is no honey-board or partition between the lower and the upper stories. For the bees to reach it conveniently, there should be nothing between the upper and lower frames.

4. The place which you describe would not do to winter your bees unless they can be arranged in it so as to have a flight on warm days. Confining them to the hive in such a shed would cause them to fret and die on warm days. We would advise leaving them preferably on the summer stand.

Wintering Queens Apart From Bees

I have a number of hives from nuclei, divided in July. Some are doing first rate, others not so well. When fall comes, will have to unite so as to give each hive a respectable cluster, and in the spring would like to subdivide them again into same number of hives. How can I winter the queens, meantime, apart from their bees? How did Pratt, from Swarthmore, winter 75 in one hive? DELAWARE.

Answer.—We tried the Pratt method; did not succeed. We do not believe it is usually successful, though some people may succeed. We doubt that Pratt himself tried it often. If you can succeed with what you suggest, we would like to hear about it. We have never considered it practical. Did any of our readers ever try and succeed? How many times?

Indications of Swarming

I bought 3 hives last fall; one was very weak and died out. I now have 2 strong hives. What I want to know is this: What are the general indications of the hive when about to swarm? Can you tell 2 or 3 days prior to swarming? What is the matter with them when they hang out on the hives and fight or drag one another around? I have watched mine several days and found them restless, noisy and seemingly fighting each other. They seem to be settled down and more quiet now. KANSAS.

Answer.—It is not an easy thing to tell from outside indications anything about when or whether a colony will swarm, unless it be their running about on the front of the hive just as they are about to begin swarming. Sometimes they will cluster out a day or two before swarming, but that's no sure sign, for if the weather is hot and the colony strong they may hang out when they have no notion of swarming and if well ventilated they may swarm without hanging out.

But it is not hard to look inside the hive and then you can make a pretty good guess as to their intentions. If you find a dozen or more queen-cells started, you may expect a swarm to issue about the time the oldest cell is sealed over and that is usually about eight days from the time the egg is laid in the cell. Even then you cannot always be sure they will swarm, for if, by any means the honey-flow suddenly ceases, as by a cold, wet spell, or a severe drought, swarming will be given up and the cells be torn down. There may be cells present not intended for swarming, but superseding; but in that case the cells are likely to be not more than four or five. Sometimes, however, cells may be started for superseding and changed to swarming, and *vice versa*.

Queen Rearing—Extracted Honey

1. What is a good way for a small beekeeper to raise 8 or 10 queens at a time?

2. What are the main requirements to meet in order to advertise your honey as "pure extracted honey?"

3. Is a hive raised on 4 1-inch square blocks (one on each corner) too much ventilation in cool weather?

4. What is a good way for increase on a hive to say four more colonies?

5. Say, for instance, I would get 2,000 pounds of extracted honey some year What is a good way to dispose of amounts like this? What is being paid for extracted honey at present? Comb?

6. What is a good way to operate 100 colonies for extracted honey?

7. What is a good way to winter bees in damp, rainy, cool winters?

8. Is it a good plan to scatter your hives, set them in fives, or how would you advise so that they can tell their own hives quickly?

9. Have you any record of a bee disease that invades the western beekeepers (Washington) every few years, or is there no certain disease? WASHINGTON.

Answers.—1. Select the colony that you think has the best queen in the yard. Give it brood, or brood and bees, from other colonies, till you have a strong colony with a dozen or more frames of brood. When a good flow of honey is on, take two frames of brood with adhering bees and the queen, and put in a hive on a new stand. A lot of queen-cells will be started in the queenless colony, and before the oldest has time to hatch, say in about 10 days, divide the colony up into nuclei having one or two broods in each nucleus. See that each nucleus has a cell located near the middle of the brood-nest, and for this purpose you will need to cut cells from some combs and fasten them on others. If you are very successful you ought to have a laying queen in each nucleus in about a month from the time you took the queen away. At the time of breaking up the colony into nuclei it will be well to let the hive containing the queen be returned to its old stand, letting a nucleus take the stand the queen has just left.

2. The chief thing is to have an article well ripened and of best quality.

3. No, during hot weather and honey-flows; yes, before and after.

4. Do as directed in the answer to the first question, and let each nucleus build up into a colony.

5. Put up a sign, 'Honey for Sale," and let customers call for it; go to the homes of customers with sample and take orders; or, leave it at groceries, either selling or trading it outright, or letting it be sold on commission See quotations in bee journals for present prices.

6. Get all the information you can from books on beekeeping, from bee journals and from attendance at bee conventions, and then from all this select the plan or plans that you think best fitted to your conditions.

7. The same as for any other winter. You cannot tell in advance whether a winter will be wet or dry, cold or hot—although winters are not likely to be hot in your locality.

8. Yes, the greater the dissimilarity in appearance the better; although for the convenience of the beekeeper I prefer regular

groups of four. See discussion of this matter in June Journal.

9. I don't know of any disease occurring periodically.

What Kind of Plant

I send you by parcel post some plants that grow here, especially in the limestone quarries. They blossom continually from now until a killing frost in the fall, and the bees work on them all the time I have seen them leave sweet clover alone right beside these and work on this plant. Can you tell me what its name is and describe it and its general value as a honey plant? NEW YORK.

Answer.—The plant is the Blueweed or Viper's bugloss (*Echium vulgare*). It belongs to the Boraginacea family, having a woolly stem, like borage. You will find it described on page 45 of 'American Honey Plants," by Pellett. Sladen lists it as an important honey plant in southern Ontario. It is probably not abundant enough to be of importance in many places.

Size of Hive— Foundation

1. An old beekeeper here told me that my hives were too large for this country (I have 10-frame Langstroth). Is an 8-frame better than a 10-frame hive where the amount of surplus honey is no large amount, say 40 of 50 pounds average? This is my second year with bees, and if this is so, next year I will order 8-frame hives.

2. This same man told me that a new swarm would not stay in a hive with full sheets of foundation as easily as with starters. Is this so? TEXAS.

Answers.—1. Having never kept bees in Texas, I do not know upon what basis your "old beekeeper" builds his assertion. But I know that an 8-frame hive is not large enough to develop fully the breeding capacity of a prolific queen. So, if a queen in an 8-frame hive can produce bees enough to harvest 40 pounds of honey, I am of the opinion that the same queen, if prolific enough, will produce bees enough in a 10-frame hive to harvest 50 pounds of honey.

2. On this question, also, it would be interesting to know what reason the "old beekeeper" gives to explain why a swarm would not stay as readily in a hive full of foundation sheets as in a hive containing only starters. We have never seen any cause for making such a statement.

Molasses for Food

1. Can Molasses be fed to bees to save syrup and honey?

2. What is present price of molasses in barrel quantities? DELAWARE.

Answers.—1. During the time when bees are flying daily almost anything sweet may be fed with safety, provided the bees will take it. For winter stores one must be more particular. On the whole, however, when one cannot have good honey, nothing is better than the best granulated sugar. Even at its very high price, men of large experience are buying it this year to feed by the ton.

2. I don't know, and what I could buy it for here, might be no guide for you.

Drones

In looking over a hive of bees for queen-cells I found a strong hive with plenty of worker brood and plenty of honey. That hive had 5 combs that had drone-cells that were nice and clean, but no sign of drone-brood or eggs in drone-cells. The queen had laid in all the cells right up to the edge of the drone-cells and then had passed on. There were between 50 and 100 drones in the hive, and part of them were black, showing that they were raised in some other hive.

All my other hives have an over abundance of drones and drone brood, and my records show this queen to be 2 years old. If you can see in this any chance of developing a strain of queens that would refuse to lay drone eggs she is at your disposal, as she is supposed to be of your strain.

Answer.—If bees are anxious to rear drone-brood, they will go quite out of their way to do so, sometimes when there is no drone-comb inside the cluster passing over one or two frames outside the cluster to occupy drone-combs. If conditions are such that they do not wish to rear drones, drone-cells inside the brood-nest will be left unoccupied. Not always, however. I have seen a good many cases in which drone-cells had eggs laid in them, and *workers* were reared from the eggs. But before eggs were laid in them the mouth of each drone-cell was contracted to the size of the mouth of a worker-cell. So it is nothing unusual to find plenty of worker-brood, but no drone-brood, although drone-cells are convenient. But at a time when colonies in general in the same yard are rearing drones, to find a queen *two years old* with drone-cells easily within reach unoccupied, is unusual. The likelihood is that at least some of her royal progeny will show the same characteristic, and by persistently selecting such to breed from, there is a probability that in time this characteristic may be more or less fixed. No great skill in the case is required on the part of the beekeeper, and you may do the work perhaps as well as an expert. But patience is required in anything of the sort, and you must not expect results in a day.

(When queens are very vigorous, they often prefer to lay in worker-cells. The drones that you mention as being in the hive may be her own drones, as the color of the drones is often irregular.—Editor.)

Unfinished Sections

How do you get the bees to take the honey out of the unfinished sections, so that these may be used as bait sections the following year, and without having the combs torn to pieces? Or do you leave the honey and use the sections as they were taken off, provided the honey in them is not granulated? CALIFORNIA.

Answer.—I wouldn't want to have the least bit of honey in bait sections, whether it was granulated or not. If there is honey enough in the sections they may be extracted. Whether extracted or not, they should be cleaned out by the bees. I have tried different ways of getting a colony to clean out sections without letting the bees of other colonies have access to them, but never with great success. So the sections must be set out in the open, allowing the bees to *rob* them out. If you set out a single super of sections for ten or more colonies to rob out, you may count on the combs being torn to pieces. Reverse the thing, setting out ten or more supers with only one colony to work on them, and there will be no tearing. So if the number of sections to be cleaned be large, give the bees full access to them; the more exposed the sections are the better. But if the sections be few in proportion to the number of colonies, say less than a super for each colony, then give the bees very limited access to them. Pile five supers in a pile, and allow an entrance for only one bee at a time. Or, pile the supers up highe., and allow the small entrance named for each five supers.

(A very good way to get the bees to remove the honey is to place the super under the brood-chamber instead of on top of it.—Editor).

Ventilation—Introduction

1. Are 1-inch blocks too high on bottom-boards to raise the hive for ventilation? They have not built any comb from bottom frames to bottom-board yet.

2. I have a colony to which I gave the above ventilation and have them tiered up about five stories to prevent swarming. The other day I noticed a few bees at the entrance fanning with their heads half in the hive. What was the meaning of this?

3. Will a pound of bees and a queen received June 14 build up by fall?

4. When I receive a queen could I take the old queen and give her a 10-frame super and bees in it and set her on a stand and introduce the new queen to the colony?

5. What is the best way to run for extracted honey?

6. What is a good way to unite bees? WASHINGTON.

Answers.—1. With a space of an inch between bottom-bars and bottom-board there may and there may not be combs built down. But these may easily be cut away when it comes time in the latter part of the season to let the hive down.

2. It meant that fresh air was needed in the hive. No amount of space under the hive, and no amount of tiering up, can be counted on as a sure thing against swarming. But you can greatly increase the effectiveness of tiering up if you have ventilation between each two stories, "staggering" them, that is, shoving the stories alternately forward and backward.

3. Very likely, if the season is good enough.

4. Yes, it will make introduction safer if you give the new queen to the super placed on a new stand. I you want the new queen on the old stand you can afterward let the two hives swap places.

5. Just put on extracting combs a little before the bees are ready to store surplus.

6. The newspaper plan is a good way. Put a sheet of newspaper over the topbars of one hive and set the other hive over it. The bees will dig down the paper and unite kindly. Four or more days later you can assemble in the lower story the best frames of brood of the two stories.

Requeening—Best Race

1. When is the best time to change queen? I have a hive of native bees and I don't like them, so I want to know when is the best time to kill the old queen and introduce an Italian queen; and will they accept a queen of different breed?

2. Do bees know their master? I can do anything with my bees and they won't sting, but when a stranger gets near the hives they sting him.

3. Last year I got 7 supers of honey from one 10-frame hive. Does anyone ever get any more? The bees that did the job I got out of a tree the year before. I got 46 one-quart fruit jars full of strained honey.

4. The bees don't swarm. What is the reason?

5. Which is the best honey producer, the golden or leather colored Italian bee? WASHINGTON.

Answers.—1. Other things being equal, there is perhaps no better time than toward the close of the harvest. You can get as good queens then as at any other time; the cost of a queen will be less than early in the season, and changing the queen then will interfere less with the honey harvest. Of course, if it is early in the season and you want a new queen to breed from that season, it would be better to get the queen earlier in the season. A colony will accept a queen of any other breed.

2. No, I don't believe bees know their master. Some people are more likely to be stung than others, because of their movements, odor, or something else; but such persons are as likely to be stung by their own bees as oy others.

3. As many as 16 supers of sections have been stored by a single colony, each super containing 24 sections. Of course the yield would be greater if the honey were extracted.

4. Hard to say. It may be that your management may have had something to do with it, and it may be that the bees are somewhat inclined to non-swarming.

5. Some goldens may be better than leather-colored in the same yard, and the reverse may be the case. Take it as a general rule and the leather-colored may be the better.

Transferring—Drones

1. How late in summer can I change bees from old hives to modern hives?
2. My bees look to be one-third drones at times. What can I do to get rid of them?
3 What is the trouble when bees bring out larvæ that are black in color? Have they a disease? If so, what is the treatment?
TENNESSEE.

Answers.—1. Don't attempt to do it when the crop is over. You might succeed, but the chances are against you. The best time to do it is spring, when the first fruit trees are in bloom. During the honey crop you may drive the bees out into a box and then hive them in a good hive just like any other swarm. Then place the old hive near the new one and at the end of 21 days shake all its bees in front of the new hive and remove it to use what honey and comb there is in it.

2. You might use a drone trap, but that is a nuisance at best. Better remove all the drone comb in the spring and replace it with worker comb. That is the only rational way.

3. Carrying out of dead larvæ by the bees may be caused by starvation, or sacbrood, or European foulbrood. Open the hive, and if you find dead brood in the combs cut out a piece of comb and forward it to Dr. E. F. Phillips at the Bureau of Entomology at Washington. He will tell you just what it is and give you advice free of charge. Be sure and pack it so it will carry safely without leakage or breaking. If you write to Dr. Phillips beforehand, he will send you a box in which to mail the diseased combs.

Sweet Clover—Mating

1. Does melilotus always yield nectar, or is it like other plants, a failure sometimes?
2. Should I devise a way to mate a young queen with the drone that I wanted to and know that it was done, would it be profitable? That is, would it be a money-making business? Has such a thing ever been tried? If so, will you give some of the ways that have been tried? MISSISSIPPI.

Answers.—1. Melilotus is just like any other plant. There are times when there is no honey in its bloom. Honey yield depends much upon the weather. There are also localities where one honey plant will yield while it may not in another. So far, there is no valid explanation of this.

2. If you can devise a way to mate a young queen with the drone of your choice, you will achieve something that no one has been able to do. It would be profitable, of course. The thing has been tried, by artificial or forced copulation, by shutting the queen with the drone in a glass cage and also by putting the queen and a lot of drones in a vast screened house. An occasional success has been claimed, but it was either an accidental success or a sheer mistake. We don't believe it can be done; yet in this time of aeroplanes and wireless telegraphy, who knows what might not be done?

Martins

I have my first colony of bees, also a numerous family of martins. Now comes my neighbor, a mountain Kentuckian, and tells me the martins will eat all my bees. I killed one of the martins and could find no bees in him, and now I am feeling rather badly about it. Please tell me if I should get rid of the birds. If so I will take down their box, for I don't believe I want to kill another one of them.

P. S.—This is the box martin, not the so-called bee martin or kingbird.
KENTUCKY.

Answer.—If you refer to the purple martin, known as *Progne subis* by scientists, we have never heard of its eating any bees, though it feeds on insects, as do all the swallows, to whose family it belongs. As to the king bird, or bee martin, *Tyrannus tyrannus*, although it eats bees, there is a question as to whether it eats any but drones. The American Bee Journal, in 1895, published 9 articles, at different times, on the kingbird. The statement was made there that in 1893 examinations made under the direction of the Secretary of Agriculture showed that, among 171 stomachs of bee martins or kingbirds examined, only 14 contained bees. Out of these 14 stomachs, 50 bees were taken, but only 4 of them could be identified as workers, 40 of the others proving positively to be drones. The conclusion is that, except in a queen-rearing yard, where they might eat young queens at their wedding flight, the bee martin is more beneficial than injurious, for it eats thousands of other insects. As to the one to which you refer, we find nothing against it anywhere. If any reader of this knows facts on the subject, we will be glad to have them.

Will Bees Do Well?

Will bees do well one or one-half mile, more or less, from the ocean? WASHINGTON.

Answer.—An apiary one half mile from the ocean will lose a part of its pasture, since bees go at least a mile for honey and pollen. But if the pasturage is very ample on other sides, it may not hurt the crop. We would prefer to have them about two miles from the sea. Then there would be little or no loss of pasture.

Outdoor Wintering

What is your opinion in regard to the method of outdoor wintering as recommended by Dr. Phillips, viz.: packing in four colony cases? I have studied his bulletins quite closely and his reasoning appeals to me. I intend to adopt his plan, as I have no cellar suitable for wintering. WISCONSIN.

Answer.—The method recommended by Dr. Phillips is certainly good. The only objection is its cost. But it probably pays to follow it, even if the outlay is large. Where we are located, the winters are rarely very cold without some warm days, and bees winter fairly well. But in the North, it is best to follow some method of heavy packing. We would prefer 2-colony cases to 4-colony cases, because we do not have to move the bees for winter, and none of them need face north. We don't like a north entrance. Wintering depends so much upon locality that each man must decide for himself what method to follow. But the Phillips methods will certainly not disappoint you.

Honey Vinegar

Kindly give method of making honey vinegar and explain how a hydrometer should be used; also what degree of sweetness this liquid should be; number of days to ferment.
MISSOURI.

To make good vinegar there is no particular need of a hydrometer. Those instruments are not found easily, except in well furnished drug stores, and they are made of different kinds for different purposes.

To make good vinegar, take a pound and a half of honey for a gallon of water. Mix thoroughly and add some yeast, or some fruit juice, to start the alcoholic fermentation, which must precede the acetic. If you are trying to make vinegar out of water used in washing cappings and you don't know what proportion of honey you have in the liquid, just put an egg in it and add honey till the egg floats so as to show itself at the top of the liquid. If the egg shows more than the size of a dime at the top, the liquid is too sweet, and more water must be added.

To cause it to ferment, it must be kept warm, about 70 to 80 degrees. The length of time of fermentation will depend upon the temperature, and there is nothing definite about it. In good circumstances it will require a week to go through the alcoholic fermentation. Then, if the liquid has access to plenty of air, it will begin to sour. A little vinegar or vinegar mother, will help it to become acid.

They use all the way from one pound of honey to two and a half pounds, to make vinegar, but about the amount mentioned above is best. The more air you will give it, the faster it will sour, if kept warm. Vinegar makers let the vinegar drip through oak shavings to hasten the fermentation. Be sure and keep the flies away with either screens or thin muslin. Grape juice or apple juice, not boiled, will hasten the fermentation considerably.

Races of Bees—Ants

1. I caught a swarm of bees August 3, 1919. They are bright yellow bees. Some tell me they are Italians. They are very gentle, but they don't seem to gather much honey. Can you tell the race of bees by looking at them?
2. I live in a small village and flowers are not very abundant in this locality. I was thinking of sending for a Cyprian queen, as I read that Cyprian bees gather lots of honey. As for managing them, I suppose I could get supers on and off by using a veil and gloves.
3. What would you advise getting, a Cyprian or Italian queen? Also where can I get Cyprian queens?
4. How do beekeepers having outapiaries keep their bees from being robbed by thieves, especially at night?
5. How do you keep ants away from hives, especially from double-walled chaff hives that are packed for winter?
6. Can you tell me who the apiary inspector of Illinois is? Have they also a county inspector? ILLINOIS.

Answers.—1. Italian bees have 3 yellow rings on the abdomen or 3rd section of the body, next to the thorax or middle section. Probably there is no honey to gather at the time of your writing.

2. Cyprian bees cannot gather honey if the Italians cannot.

3. We would advise buying Italian bees. There are very few Cyprian bees left in this country, probably none pure.

4. Thieves steal hives of bees once in a while. But if your outapiaries are near a farmer's home, there is no more danger of their being robbed than his hen roost, or his grain bins.

5. You will find answer to the question of ants in the July number.

6. The Illinois apiary inspector is A. L. Kildow, of Putnam.

Swarms Clustering

1. Why do the bees form a cluster on a tree while swarming, instead of going straight to the place that they prepared for a home?
2. How do the bees manage the hunting and preparation of their new home before they swarm, and do the bees that expect to stay in the old hive have a part in that work?
NEBRASKA.

Answers.—1. The bees form a cluster, because the old queen, being heavy with eggs when she goes, appears to be unable to take a long flight without preparation. At least that is the surmise of all experts. To strengthen this opinion comes the fact that secondary or afterswarms, often fly away without settling, because the young queen is able-bodied and evidently does not hesitate to take flight. If anyone knows of a better explanation, let's have it.

2. We did not believe that bees hunted for a home before a swarm left, until we had the following experience, which we have recorded in the "Hive and Honey Bee";

About fifty yards from our home apiary there was a hollow oak tree, which we called the "squirrel's oak," because every season it sheltered a family of these pretty animals. One summer we noticed several bees flying in and out of a hole in one of its largest limbs. It

seemed to us that they were cleaning the hollow, and we supposed that a swarm had taken possession of it. A change in the weather having taken place, the swarming preparations were discontinued and we never again noticed bees around this hole. The tree was cut down the following winter and no trace of comb was found in the hollow. It proved conclusively that the bees which we had seen were scouts in search of a lodging.

Evidently a few only of the bees which are bent upon swarming take any interest in the search and preparation of a new home. Most of the bees probably have no thought of it.—C. P. D.

Eggs in Queen-Cells

In the American Bee Journal for June, page 203, you say that a queen does not lay in a queen-cell. How do eggs get in any queen-cell if she does not place them there? Do not bees build cells, when making preparations for swarming and the queen places an egg in each one? *I have seen a queen lay in queen-cells,* but I supposed it was due more to excitement when opening the hive. Have the bees power to move eggs? ILLINOIS.

Answer.—Beg pardon, but you took what "Michigan" wrote for our own statement. We wrote at the foot of the article that "we were inclined to believe that queens never lay eggs in queen-cells, until a number of people testified to seeing them do it."

You ask "how do eggs get in a queen-cell if the queen does not place them there?" We will reply with another question. How do eggs get into queen-cells, after the queen has been removed from the hive? We all know that if we make a colony queenless, even though there are no queen-cells built, the bees will have some built and larvæ of the proper age in them, within 2 or 3 days, if they only have the young larvæ to use. Let us watch the bees and learn more!

Robbed Bees—Ants

I have a colony of bees in a common box gum, about 10 or 12 inches square and 3 feet tall. One night this week I attempted to rob it. Upon opening the top of the hive I found they had no honey handy. The comb ran up like mountain peaks, but did not seem to contain any honey. The man I bought this colony from said they swarmed about the first of June last year. This year they have not swarmed, to my knowlwedge. When I opened the hive I noticed a great number of small ants seeming to be inside the hive. I have understood that ants eat the honey. Can you tell me how to get rid of the ants and how to keep them out? KENTUCKY.

Answer.—The hive was evidently robbed last year, or before it was sold to you by the previous owner. The comb was cut out of the inside top. The bees, undoubtedly not being very strong in numbers nor very rich, attempted to build upwards from the cluster instead of building downwards from the top, as they always do when they are strong. That is why the combs are built in "mountain peaks." They have to brace them against each other when they build upwards. Bees have much more intelligence than some people give them credit for.

The fact that you tried to rob them at night shows that you need to "read up" on bees. There is no worse time than night to take their honey from them, as the old bees are all at home and there is much more danger of stings than in the warm part of the day.

If the ants were really on the combs it would indicate that the colony was very weak, as they never allow ants where they can keep watch of the combs. It may be that these ants were in some crevice on the outside, taking advantage only of the warmth of the hive. Of course they are fond of honey, but the honey of a healthy colony is not in any danger from them.

Deserting the Hive

I bought 11 colonies of bees this spring. They were in perfect condition until about a week ago, when I noted that one hive was empty. When I looked in I found that the bees were gone and the honey had been taken out. Some wax had been chewedd off as if a mouse might have eaten it, but there was no hole large enough to let a mouse in. There was some brood in the hive. What do you suppose would cause the bees to leave the hive, and what do you think ate the honey that was in the hive? INDIANA.

Answer.—It might have been a case of starvation. It is possible the colony was overcome by robbers. In some cases in spring a colony deserts its hive with no apparent reason for it. In either case it was bees that ate the honey, and the chewings of wax left by them would look much like the work of mice.

Goldens

I recently bought a golden queen, and when she came was black-tipped. Now was she a real, honest golden? Last year I experimented a little with them and all drones were leather-colored and the queens I succeeded in raising were as this queen, with a black butt, half golden, half leather. The mother golden queen was all gold on her body. You'll just have to answer for me, as you're about the only beeman that seems to answer what I want to know. PENNSYLVANIA.

Answer.—It is an accepted fact that among the Italian bees, neither queens nor drones can be relied upon to be always true to type in appearance. It is only the workers which are expected to show the regular three yellow rings on the abdomen. We have seen very dark queens which produced the finest-looking workers. A few queen breeders claim to produce queens that duplicate themselves in their progeny. But "I have me doots" about it. Don't be afraid to breed from this queen, if her workers are well marked, peaceable and active in field work. These points constitute the most important conditions in Italian bees.

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Sealed Brood

Brood being sealed, does it require any nourishment, i. e., get any?
PENNSYLVANIA.

Answer.—Of course the nurses can do no feeding after a larva is sealed, but there may be some unconsumed food in the cell at time of sealing, allowing the larva to receive nourishment after being sealed. This probably never amounts to much in the case of worker or drone larvæ, but may be considerable in the case of queen larvæ. I have seen larvæ, in sealed queen-cells, not one-fourth the usual size.

Mating Queens, Candy, Etc.

1. After hiving a swarm with a virgin queen or introducing a virgin queen, could I place a queen-excluder below the brood-chamber confining her and have her safely mate with the drone of that colony? If not, how can I purely mate her?

2. How can I make queen candy?

3. Can I make queen-cells out of beeswax? Advise me the best way.

4. Is the Rauchfuss queen cage all right for introducing queens? MISSOURI.

Answers.—1. The queen must go out to mate. She can mate only on the wing, in the open air. You must take your chances on her finding a drone of her race. When the question of control of mating is solved, a big step forward will have been made.

2. Candy for shipping queens is made by mixing powdered sugar with honey, just as much as the honey will absorb. Candy for bee feed is also made by diluting sugar in water and evaporating it by heat over a stove until the water is evaporated. Be sure not to let it burn. To know when it is thick enough, dip your finger first in cold water, then into the syrup. If what adheres is brittle to the teeth, it is boiled enough.

3. Queen-cell cups are made out of beeswax artificially. Any dealer will sell you an outfit for making queen cups. But if you want to do it on a paying scale you had best buy "Doolittle's Scientific Queen Rearing," or "Pellett's Practical Queen Rearing."

4. Yes.

Southern Locations

I am thinking some of going South to try honey producing, as I have lost most all of my bees here this last winter. Could you advise me as to what State would be a good location, or where could I find the necessary information? MICHIGAN.

Answer.—On page 206, under the heading "Location," we have answered a similar question. There are good places in each State. Most of the eastern part of Texas, also south and west of San Antonio, is good. There are excellent spots in Mississippi, Alabama, and Georgia. A good way to locate a convenient spot is to go and see some of those queen breeders in the State that you think you would prefer. They will surely be able to direct you to some spot where you will not be in any other man's way. The most important requirement is to keep away from territory already occupied.

As to the State in which you should locate, it is better for you to select it yourself.

Tar Paper—Short Bottom Bars

1. For covering brood-frames I have used tarred paper, also some of the cheap roofings, using something without gravel next to the bees. Of course I air it to get rid of some of the "perfume." I cannot see any harm to the bees or honey.

2. Why not shorten the bottom bars of brood-frames? I do not believe they will build burr comb three-fourths of an inch on bottom of hive. ILLINOIS.

Answers.—1. Although tarred paper that has been fully "aired" will probably not cause the bees to desert, if we use it on top of the brood-frames, I should hesitate to use it on the frames of a hive in which I would hive a swarm. It might be used after the swarm has put brood in the combs.

2. Bees do not usually put burr combs in a space of three-fourths inch between the bottom bar and the bottom board. But they will do it if they become crowded for room. Italian bees do it more willingly than common bees.

THE VALUE AND CARE OF DRAWN COMB

By F. W. Osler

In a short time extracting for this season will be over and preparation for winter will be in order. Among the many things too often neglected by the amateur beekeeper is the proper care of drawn comb.

The beekeeper who carefully assembles and wires his frames, uses full sheets of foundation, thereby insuring good straight worker comb and the elimination of excessive drone cells, should carefully guard them from wax worms and mice, either of which quickly destroy a set of combs. After extracting is over the supers should be placed and piled high on one or two strong colonies to clean and dry the combs. (This should be done late in the evening, to prevent robbing.) These colonies should be marked, for if foulbrood exists in the yard the colonies that clean out the combs are most likely to develop it, and should be carefully examined during the fall and following spring for any signs of the disease.

After the comb is clean and dry, which can usually be done over night, bee-escapes can be used to get rid of the bees. The supers should then be taken to the honey house or work shop. Each frame should be examined and all bur comb scraped off, to be run through a wax press or solar wax extractor later on. It is surprising how much wax can be accumulated in this way.

When the frames are cleaned, return them to the supers, spacing them wide (about 8 to 10 to a 10-frame super). Now place a cover on the ground, bottom side up, and place your first super in the cover; pile the others on top, put a queen excluder on the top one and an empty super with a tight cover on top of all. The combs are now ready to fumigate with carbon bi-sulphide. Take a shallow dish and fill it with carbon bi-sulphide solution and place it in the empty super resting in the queen excluder; close the cover and leave for 48 hours. This treatment should destroy the wax moth larvæ and will leave your combs sweet and clean for next summer's use. Frames of honey kept for spring feed should be treated in the same way. It is just as well to examine the comb two or three times during the following month to satisfy yourself that nothing further is developing, as it is a question as to whether this treatment kills the unhatched eggs of the wax moth or not. It is a good plan to put your comb out when cold weather sets in and give them a good freeze after the bi-sulphide treatment, but the fumigation must come immediately after extracting, as wax worms are fast workers. Frames of honey should never be frozen, but empty, dry comb will not be harmed by the cold.

Just a word of warning about carbon bi-sulphide. This solution produces a heavy gas, which falls through the supers, destroying the wax worms in the comb. The fumes are poisonous and highly inflammable and will produce headache and nausea if breathed too much. The open air is the safest place to handle it in. Perhaps it would be just as well to warn my readers to get their lives insured and phone the undertaker before drinking any of this solution.

Comb can be saved from rats and mice by keeping queen excluders on top of the supers.

Toronto.

DES MOINES COUNTY MEETING

The annual meeting of the Des Moines County Beekeepers will take place at Burlington, Iowa, on October 20, 1920. Beekeepers are invited. For particulars address Mr. J. W. Stine, Route 4, Burlington, Iowa. Some one from the American Bee Journal staff will probably be present.

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FOR SALE—100 colonies of bees, 50 old hives, 2-story 8 and 10 frames; 50 new 10-frame; $250 of bee supplies, all for $1,000. Good bee range, first-class condition; all 1920 queens. J. H. Swanson, Gen. Delivery, Phoenix, Ariz.

FOR SALE—55 colonies of bees, in 10-frame standard dovetailed hives, wired frames, free of disease; in first-class shape.
G. H. Creech, Central City, Neb.

NUCLEI for 1921—We beg to advise those who intend to purchase nuclei to enter their orders early in order to be certain of being able to obtain them, as the demand greatly exceeded the supply during the past season, and the majority of late orders went unfilled. We are now booking orders for three-frame nuclei of Italian bees, with Italian queen, at $6.50 Hybrid bees, with guaranteed pure Italian queen, at $5.50. Terms, one-third down with order. No disease, safe arrival and satisfaction guaranteed. Irish Bros.,
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WHEN BETTER QUEENS are raised Victor will raise them. Italians, mated, $1.25 each; six, $7; twelve, $13.50.
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FOR SALE—Hardy Italian queens, $1 each
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FOR SALE—Superior California Queens—Western beekeepers may now secure our famous Italian queens at the following prices: One untested, $1.25; fifty untested, $57.50; one hundred untested, $100. Orders filled in rotation; first deliveries March 1, 1920.
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WANTED—Beeswax. At present we pay 38 cents per pound in cash and 40 cents in trade for clean, yellow wax, delivered Denver.
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TEXAS HONEY PRODUCERS ASSOCIATION

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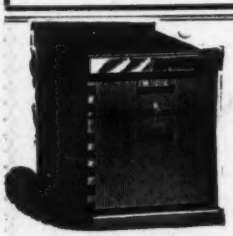

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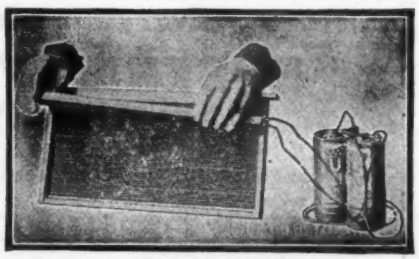

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32x3½	6.90	1.90	36x4½	11.40	3.30
31x4	7.90	2.15	35x5	12.40	3.40
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Send list of your needs or request for new Catalogue to Department B.

Crop and Market Report

Compiled by M. G. Dadant

For our October report we asked reporters to answer the following questions: 1. What has the crop been? 2. Condition of bees and honey plants? What is being offered for honey? 4. What are you asking, wholesale and retail?

THE CROP

In the New England States the crop has been fairly good, Connecticut quoting it fine. Rhode Island, Vermont and Massachusetts seem to have had a shorter crop as well as Maine.

In New York the crop seems to have varied greatly, since some localities report a normal crop. Foulbrood has cut the output in some sections and is having its effect on the total of the crop.

In Ohio, Indiana and Pennsylvania the crop has been fair, and Illinois has a better crop than last year, although the fall flow fell short considerably of what was expected. There will be about half as much fall honey as last season. In Iowa there will probably be an average of 100 pounds per colony the State over, the western side of the State showing the best crop. Kansas and Nebraska have had generally fair crops of honey and Missouri will average probably 75 per cent.

In Michigan there will probably be 75 per cent as much honey as last year, while Wisconsin is blessed with a good crop, although not as many bees as usual to care for it. The average of reports from Wisconsin will give over 100 pounds per colony. Minnesota reports good crops also.

In the Southeastern States, although there has been a published report that the crop was extra good, our reporters state the opposite. In the Appalachicola district there will not be over one-third of a crop, and this will probably extend over Mississippi, Alabama and well up into Tennessee and Kentucky. In fact, in all of our reports we find no mention of anything like a normal crop, except in the Carolinas and possibly in Louisiana, which we understand in some sections has had an unusually large crop.

Texas early honey was in abundance, but the later crop does not seem to be yielding as well as last year.

In the inter-mountain States we find that Montana will hardly have half of last year, Idaho a little more than half and Colorado also hardly half of what was harvested in 1919.

In Washington and Oregon the crop has been fairly good, although nothing phenomenal. Arizona and New Mexico have also had good crops, but hardly up to last year, while California reports are conflicting. Some of them state there will be not over half a crop, while others have had an unusually large crop. From the amount of honey on the market now from California, indications are that the crop was nearly up to last year. Utah and Wyoming seem to have had very good crops.

BEES AND PLANTS

Throughout the whole of the North, Central and Eastern States conditions seem to be improving for honey plants, for next year. Some parts of the country were needing rain badly, but late rains have remedied this.

Few sections are affected by drought to the extent of having any influence on the 1921 crop.

PRICES OFFERED

There seems to be a little shyness on the part of buyers of large amounts of honey towards quoting a price except for immediate delivery. Eastern beekeepers have sold comb honey at $7 per case, with extracted at about 18c to 20c. The usual offer is on a basis of 18c f. o. b. eastern points for nice white honey. The amount of New Zealand honey imported so far seems to have been small, so that it should not have had a large effect upon the market.

WHAT IS ASKED FOR HONEY

In a retail way the country over, on a basis of 10-pound cans, the price is from 26c to 30c, and our reports would indicate that beekeepers are selling honey very freely for this time of year. In our own locality honey seems to be moving better than usual at this season. All beekeepers east of the Missouri river seem inclined to hold their honey at a good price, say 20c for extracted honey, wholesale, and many offers for white clover at 18c have been declined. In the Southeast the beekeepers generally are holding for a good price, also, owing to the fact that their crop has been small and they feel they must realize.

Colorado and Montana and Idaho, having a short crop, will undoubtedly hold their honey at a good price, say 18c to 20c for white alfalfa, with a proportionately good price for comb honey.

The Texas crop is practically disposed of, the Texas Association having handled this in an excellent manner for its members.

There seems to be a disposition on the part of beekeepers in the extreme West to get rid or their honey and to cut prices to do so. We know of many offers of carloads of amber alfalfa honey at 14c to 15c per pound, and one or two offers of extra fancy white sweet clover and alfalfa honey as low as 15c per pound. We can see no reason for this low price, even though the price of sugar is dropping. The demand for honey is good generally, although the large bottlers are not buying at the high prices.

In our estimation, whether honey prices will go down or not is to be determined largely from the attitude of the beekeeper, whether he is to force the price down in competition with his neighbor or make an effort to hold the price to a reasonable basis.

Without a doubt, the buyer of honey will not seek 20c honey when 14c and 15c honey, equal in grade, is being offered. We have several indications that the sugar market will drop more, and some reports are being circulated that the price of sugar, wholesale, is to go to 10c before it stops. This, however, is merely a conjecture. Nor is it necessary for the price of honey to follow that of sugar now that a good market has been created for the beekeepers' product.

A New Book, *"Dadant's System of Beekeeping"*

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¶ Standard 5 gallon square cans in heavy, first class shipping cases, of either one or two cans each. Get our quotations on bulk shipments.

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¶ We will be glad to estimate and quote on what containers you are going to need to market your crop, if you will let us know how much honey you expect to market. We believe that we can interest you.

¶ Remember, we can ship at once. Located as we are in the very focal center of Western shipping activities, we can save you valuable time, and perhaps excessive freight charges.

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THIS IS THE 'SIGN' ON EACH CYPRESS BOARD

S C M No. of Mill A

TRADE MARK REG. U.S. PAT. OFFICE

DON'T GUESS MAKE SURE. 'HAVE A LOOK'

For all uses that invite decay (for instance, bottoms) demand

"ALL-HEART"

"Tidewater" Cypress

"THE WOOD ETERNAL"

The "arrow" on the end of each board identifies the genuine product of the cypress mills whose CHARACTER of timber, methods of manufacture, and complete responsibility enable them to be members of the Association.

THIS FACT IS YOUR PROTECTION.

ACCEPT NONE BUT TRADE-MARKED "TIDEWATER" CYPRESS

CYPRESS LASTS PRACTICALLY FOREVER

CYPRESS DEFIES DECAY

SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION

1251 Hibernia Bank Building, New Orleans, La., or 1251 Heard National Bank Building, Jacksonville, Fla.

Insist on TRADE-MARKED Cypress at Your Local Lumber Dealer's — If he hasn't it, LET US KNOW

FOREHAND'S THREE BANDS THE THIFTY KIND

Twenty-eight years of select breeding brings these bees up to a standard surpassed by none, but superior to many.

Place your orders now. We have booked as many orders for pound bees as we can handle this season.

PRICES AFTER JUNE 1

	1	6	12	100 Each
Untested	$1.50	$ 7.50	$13.50	$1.00
Select Untested	1.75	9.00	16.50	1.25
Tested	2 50	13.00	24.50	2.00
Select Tested	4.00	22.00	41.50	3.35

No reduction in prices after July 1 as stated in circular.

W. J. FOREHAND & SONS, The Bee Men

Fort Deposit, Alabama

QUEENS **PACKAGE BEES** **QUEENS**

ORDERS are coming in daily for 1921 SHIPPING

My FREE Circular gives prices, etc., in detail. Safe delivery GUARANTEED. We ship thousands of pounds all over the United States and Canada.

Our Fall flow is very favorable for Queen rearing up to about Christmas. So we can furnish you queens the balance of this year at the following prices:

	1	6	12	50	100
Untested Queens	$1.50	$7.50	$13.50	$48.00	$95.00
Select Untested Queens	1.65	8.25	14.85	52.80	104.50
Tested Queens	2.50	13.50	27.00	110.00	
Select Tested Queens	3.00	16.30			

NUECES COUNTY APIARIES, E. B. AULT, Prop. CALALLEN, TEXAS

THREE WAYS IN WHICH BEEKEEPERS CAN SAVE

So long as lumber, together with all kinds of iron products and labor costs, remain at present abnormal prices, the prices of beekeepers' supplies will have to remain abnormally high, too. We dislike this situation as much as the beekeeper. It is no good to us, and we know it, and we trust the situation will correct itself as the war times recede.

In the meantime can the beekeeper do anything to economize and at the same time keep his business going full steam ahead? He can. There are three ways open to him right now:

MONEY-SAVING PRE-WAR PRICES.—There are pre-war prices still existing on some considerable lists of goods kept at our Branch Offices at Philadelphia, Norfolk, Indianapolis and Chicago, and at the Home Office at Medina. These lists of very low-priced supplies include shipping cases, bottom-boards, covers, frames, sections, smokers, queen-rearing tools, fences and separators, etc. These are new goods, but in most cases they are in sizes or styles that we no longer list, and so prefer to close them out at a big sacrifice. Those who can manage to use these goods will make a big saving by ordering while they last. The prices are only one-third to two-thirds the prices now made on standard goods. They are offered subject to previous sale. Don't delay. Write for lists to Medina Home Office.

SAVE FREIGHT CHARGES.—We have car-lot agents at many points over the United States, as well as Branch Offices at 23 Leonard St., New York; 10 Vine St., Philadelphia; 224 West Huron St., Chicago; 290 East 6th St., St. Paul; 10 Commerce St., Norfolk, Va.; 874 Massachusetts Ave., Indianapolis; 224 Poydras St., New Orleans. By ordering from our nearest agent or Branch Office you will save freight charges—and these freight charges have advanced about 70 per cent as the result of the war.

EARLY ORDER DISCOUNTS.—By taking advantage of our early order cash discounts you can save 7 per cent in October, 6 per cent in November and 5 per cent in December. Send for our year-end special price sheet, too, when taking advantage of these early order discounts.

THE A. I. ROOT COMPANY

MEDINA, OHIO